Introduction

In February 2021, Winter Storm Uri swept across the central and eastern United States and brought extreme cold to Texas. Although this storm was not the most intense storm on record (Doss-Gollin, 2021), it did cause the largest number of power outages in state history, with 4.5 billion Texans losing power in temperatures ranging from seven degrees Fahrenheit in Dallas to negative two degrees Fahrenheit in Austin (Glazer et al., 2021). The Texas Department of State Health Services (2021) declared at least 264 Texans died from the power failure and stated, "161 (65.4%) winter storm-related deaths were extreme cold exposure-related injuries comprising 158 (64.2%) deaths from hypothermia and three (1.2%) from frostbite" (p. 2).

During this winter storm, approximately 90% of Texans received their energy from the Texas electric grid overseen by the Electric Reliability Council of Texas (ERCOT) (Texas Energy ERCOT, n.d.). The ERCOT system failed due to consumer demand sapping too much power from the various electric production systems and due to some of the systems, like natural gas and wind power, struggling to produce in the cold (U.S. Dept. of Energy, 2021; University of Texas, 2021). Even after delivering "rolling blackouts," where ERCOT rationed power by strategically shutting down power transmission to certain areas at a time, many residents were left without power from damaged or frozen infrastructure for hours and days at a time. Estimates to quantify the cost of Winter Storm Uri ranged from $80 to $130 billion in financial loss (Golding et al., 2021; Donald, 2021; NOAA, 2022). These estimates varied based on best estimates of insured losses and the cost of amount of lost power (Golding et al., 2021; Sullivan, 2021).

During and after the storm, news outlets (Irfan, 2021; Machemer, 2021) featured climate scientists discussing a long-pondered question—Was this severe weather caused or exacerbated by climate change? *Vox* published an online article on February 18, 2021, titled, "Scientists are divided over whether climate change is fueling extreme cold events: Is the cold wave that froze Texas this week a unique event or a sign of what's to come?" (Irfan, 2021, para. 2). *Smithsonian Magazine* published a similar article one day later titled, "How Winter Storm Uri Impacted the United States," and discussed at length the "controversy among climate researchers about whether extreme cold events like Winter Storm Uri will become more common or not as climate change continues" (Machemer, 2021, para. 6).

Most scientific projections indicate the increase in Earth's temperature will result in more variable and frequent weather events such as heat waves, droughts, and intense storms (EPA, 2021; NOAA, 2022; Wuebbles et al., 2014); however, some data on winter snowstorm projections indicate regional variability with northern regions more likely to experience extreme winter storms (Cohen et al., 2020). Some evidence suggests Texas is not statistically likely to experience an increase in winter storm frequency or severity, as the increase in average Texas temperatures due to climate change will make extreme low temperatures unlikely (Gerland et al., 2019). In fact, extreme cold and snow-related weather disasters in Texas have become less common and intense over time and under climate change (Gross et al., 2020). Regardless, Winter Storm Uri did happen and revealed the impact that severe weather has on vital public infrastructure.

Other iconic weather events *have* been scientifically linked to climate change (Wuebbles et al., 2014), with more than 310 climate disasters since 1980 costing the United States in excess of $2.2 trillion (NOAA, 2022). In 2021 alone, climate disasters cost the United States $145 billion in financial loss (NOAA, 2022). Climate change fundamentally impacts agriculture through increased atmospheric temperatures causing drought, affecting biomass and nutritional quality, and negatively affecting the health of the work force (Mbow et al., 2019). A 2021 Food and Agriculture Organization (FAO) report identified drought as “the single greatest culprit of agricultural production loss,” followed by floods, storms, pests and diseases, and wildfires. It highlights that “drought impacts agriculture almost exclusively,” with 82% of all drought-related impact being on agriculture compared to other sectors (UNFCCC, 2021). When considering the vital nature of food production and the vulnerability of agricultural production to climate change, it is no surprise the academic and political communities have lingered their focus here. To this point, the United States Department of Agriculture (USDA) brought in the new year by investing $9 million to “expand reach and increase adoption of climate-smart practices” (USDA, para. 1, 2022), including stakeholder assessments, adaptation and mitigation techniques, and efforts to better connect with Tribal and underserved communities.

Climate change mitigation techniques specifically have been prioritized by scientists and the federal government, as mitigation efforts aim to reduce ongoing emissions and reduce contributions to climate change (NASA, 2022; National Climate Task Force, 2022). While individual climate-friendly actions (e.g., recycling, taking public transportation) have some positive impact, most emissions are infrastructural (i.e., transportation and energy production) and will require collective action to reduce impacts on the environment (Wynes & Nicholas, 2017), such as federal mitigation policy. Despite the reality of human-caused climate change, 24% of Americans are still considered “disengaged, doubtful, and dismissive” of climate change (Sloan, 2021). Due to this public apathy, strategic environmental communicators have sought to understand determiners of support for climate change mitigation policy and climate action in general (Detenber & Rosenthal, 2020; Hine et al., 2014). While this has been investigated in environmental communication, little agricultural communications scholarship has investigated this landscape, despite climate change’s projected impacts on agricultural production and agriculture’s federally identified role in mitigation efforts. For example, one article in the *Journal of Applied Communications* (Mayfield-Smith et al., 2021) did investigate public perception of climate change on Twitter to highlight the connection between political and environmental ideologies and climate change perceptions. Although this article explored the conversation surrounding climate change, much more disciplinary research is needed to fully explore the dynamic nature of public opinion toward climate change and appropriate response actions. In this study, we sought to understand how exposure to a natural disaster (Winter Storm Uri) impacts risk perceptions and perceptions toward support for climate change mitigation policy.

Literature Review & Conceptual Framework

Prior research has explored a variety of influences on individuals’ perceptions of climate change and within this scope has revealed and investigated the relationship between individuals’ risk perceptions and their experience with extreme weather events or natural disasters. Becker et al. (2017) found prior experience with earthquakes influenced heightened awareness and knowledge levels thus resulting in perceiving earthquakes as high risk but did not include climate change perceptions in the study’s scope. Similarly, Carlton et al. (2015) supported this finding across individuals who lived under extreme drought. The study acknowledged that other research had explored the connection between extreme weather experiences and a more favorable attitude towards support for climate change action but did not find it as a significant contributor. Perhaps the relationship is not significant, because, while individuals may experience a climate change-related weather disaster, they may not inherently connect the experience with climate change.

Media have oftentimes responded to this by using climate-related extreme weather events as “teachable moments” (Zanocco et al., 2019, p. 1) for climate science or suggested behavior change. Bergquist et al. (2019) found Floridians who experienced Hurricane Irma did experience more heightened negative emotions toward climate change and strengthened beliefs that the hurricane was caused by climate change. Furthermore, the study suggested these individuals were more likely to take action toward environmental solutions. Spence et al. (2011) revealed a similar pattern by surveying 1,822 individuals in the United Kingdom, with some who had experienced flooding and some who had not. Those who had a flood experience were more likely to be concerned about climate change. To contribute to this body of research, we sought to understand the influence of prior disaster experience, with one severe weather event, Winter Storm Uri, on the public’s risk perception of climate change and their decision to support climate mitigation policy. The current study was guided by the concept of risk perceptions, or the judgments people hold that a particular hazard may impact their lives (Paek & Hove, 2017).

Risk Perceptions

Risk perceptions are influenced by a variety of factors and hold powerful potential to influence future behaviors when new risks are encountered. Risk perception is discussed in a variety of contexts and is therefore conceptualized and shaped from a variety of viewpoints. For the most part, risk perception is largely viewed as a function of feelings, judgement, understanding, or individual analysis about the likelihood of negative occurrences or impacts to the individual (Paek & Hove, 2017). When a potential threat or risk has been detected, variation in risk perception from individual to individual is not unexpected. Once a threat or risk is recognized, each individual assesses their probability of risk exposure through an evaluation process, rating the risk on a level from low to high (Pennings & Grossman, 2008). This assessment, often involving a recognition of the potential risk impacts and level of risk severity, results in an individual's perception of risk (Rehani, 2015).

Logical analysis of risk involves a period of deliberation and assessment, instinctive feelings, such as reactions or intuition to danger, as a response to handle the risk situation (Slovic & Peters, 2006). Risk perceptions are not always formed through an evaluative process, however. Individual understandings and knowledge about a risk and its impacts also influence risk perception without a great deal of deliberation (Fischoff et al., 1992). Mental representations of tenable threats also impact the formation of risk perceptions (Renn, 1998). Risk perceptions have been cited to have two main dimensions: the cognitive dimension, or the degree in which people know about and understand the risks, and the emotional dimension, or how people feel about the risks (Paek & Hove, 2017).

As the level of risk perception can vary by individual, the course in which the individual opts to navigate a risk, such as exposure to a natural disaster or extreme weather event, also varies. The majority of risk perception research has focused on how risk perceptions are shaped during immediate, short-term events. For example, when individuals fail to follow guidance for protective action, like an evacuation order, the greatest loss of life tends to occur. When concern about risk is high, individuals are more willing and more likely to be well-informed about how to respond to the risk and possess a stronger sense of control as the situation unfolds (Heath & Palenchar, 2000). On the other hand, when the risk perception is low, attention to messages and a lack of action to heed those messages aimed to manage the risk is expected (Heath & Pelenchar, 2000).

Prior Disaster Experience

Prior research indicates that when people are exposed to information or a specific risk event, they are much more likely to take action to protect themselves against future hazards (Yang et al., 2014). Perceptions of risk are developed over a lifetime through different frames of reference resulting from multiple past experiences (Brown, 2014), and it remains a key factor in the formation of risk perception (Halpern-Felsher et al., 2001). Prior experience has been explicated as how individuals become aware of, assess, and respond to a risk (Demuth, 2018).

There are varying levels of prior experience to a hazard. Individuals first will become aware of the risks of the disaster (risk awareness) and then they will make a judgement of how the event personally impacts them (risk personalization) (Demuth, 2018). In addition, the individual will create a judgement regarding the strength and severity, or rather, the vicarious and personal intrusive impacts, of the event (Demuth, 2018). Finally, the individual will have an emotional affective judgement toward the event's probability (Demuth, 2018). These dimensions of prior disaster experience have been known to influence perceptions about the perceived risk (Demuth, 2018; Greening et al., 1996; Halpern-Felsher et al., 2001).

Climate Change Mitigation Policy Perceptions

A 2020 Pew Research study found 65% of American respondents across the political spectrum said the federal government is doing too little to reduce the effects of climate change (Tyson & Kennedy, 2020). Examples of climate change mitigation policy include policy intended to regulate emissions, promote renewable energy, and encourage fuel efficiency (Yang et al., 2014). In the wake of public, scientific, and political pressures to act against climate change, academics have investigated what factors influence support for climate change mitigation policy (i.e., policy that reduces the flow of greenhouse gases into the atmosphere) (NASA, 2022; Yang et al., 2014).

Support for climate change mitigation policy has been evaluated through the lens of decision-making research with attention on the role of emotions in the decision-making process (Leiserowitz, 2006; Lu & Schuldt, 2016; Roeser, 2012). Yang et al. (2014) found individuals' issue salience, attitude toward climate information, and likelihood of systematically processing climate information are positive indicators of policy support. Lee et al. (2015) found individuals are more willing to financially support climate change mitigation policies if they perceive climate change as causing substantial harm rather than moderate or no harm. Lu and Schuldt (2016) indicated compassion for victims of a drought linked by the media stimuli to climate change caused an increase in participants support for climate change mitigation efforts, although the effect was mediated by a belief in anthropogenic climate change. An empirical, cross-disciplinary review of studies regarding public support for climate policies (Drews et al., 2015) grouped these diverse influences into three categories: 1) social-psychological factors and climate change perception, 2) the perception of climate policy and its design, and 3) contextual factors, such as levels of social trust and other cultural influences. Notably, these studies did not include experience with extreme weather in their scope, excluding Drews et al. (2015) which acknowledged the evidence as mixed.

Individual Characteristics

Scholarship has also revealed many other factors at play, including skepticism of climate science (Leiserowitz, 2006), geographic vulnerability to climate change (Lee & Cameron, 2007), and political ideology (McCright & Dunlap, 2011). Early risk communications literature from Griffin et al. (1999) included the individual characteristics of relevant hazard experience and other demographics such as gender, income, and political ideology as influences on someone's risk perceptions and risk information processing.

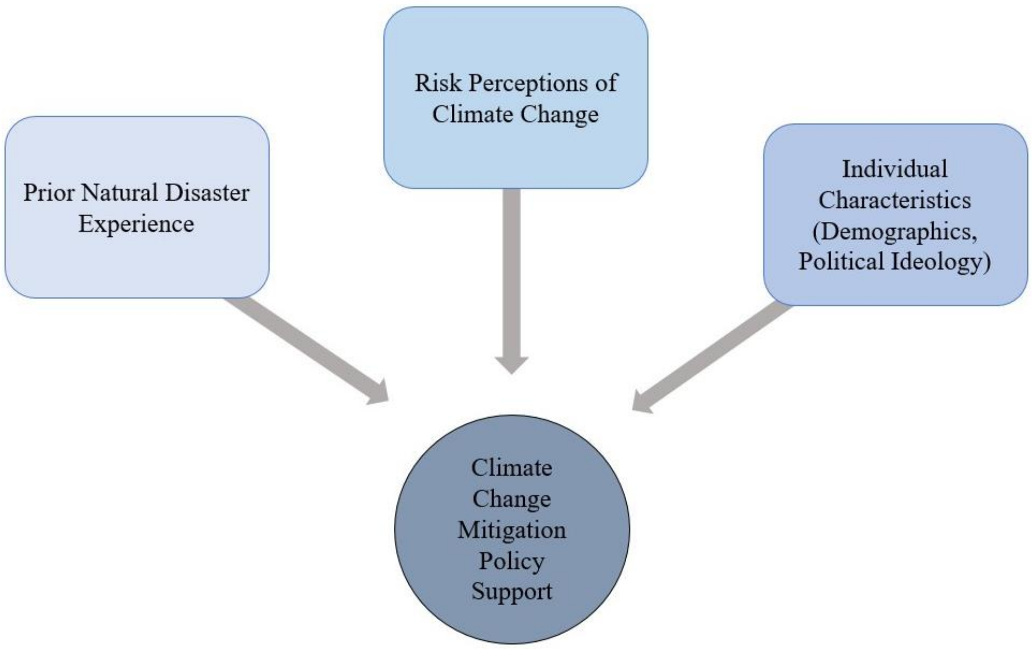
In particular, political ideology has been identified as one of the strongest predictors of an American's perception of climate change (Hoffman, 2011 a, b). A 2019 study from Yale found that while most registered voters (70%) thought global warming was happening, this percentage broke down unevenly across party lines (Leiserowitz et al., 2019). According to Leiserowitz et al.'s (2019) classification of political ideology, upwards of 95% of liberal Democrats perceived climate change as happening, compared to just 38% of conservative Republicans. Only 55% of the respondents perceived climate change as caused by human activities, which again varied by political ideology, with 86% of liberal Democrats perceiving this and only 21% of conservative Republicans (Leiserowitz et al., 2019). Some of this divide has been credited to the politically polarized news coverage of climate change, as documented in Chinn et al.'s (2020) content analysis of American climate change news from 1985-2017. They found media coverage of climate change increased in polarity over time. This media coverage reflects the two parties' ideological differences toward climate change, with news media championing popular sentiments of each party in a cycle that both reflects and informs public perceptions.

Proposed Conceptual Model

Prior experience has been linked as a key mechanism to understanding how risk perceptions are shaped in risk communication. It provides a framework to understanding the degree to which the individual becomes aware of the risk, assesses the impact of the risk on them personally, and ultimately, how they respond to risk (Demuth, 2018; Epstein, 1994). To study this context, we suggest that the more impactful the prior experience with a natural disaster, the higher the degree of risk perceptions toward climate change, and ultimately, its implications on decision making to support climate mitigation policy (Figure 1).

Figure 1

Conceptual model depicting the influence of prior natural disaster experiences, risk perceptions of climate change, and individual characteristics on support for climate change mitigation policy.



Purpose and Research Questions

The purpose of this paper was to explore the implications of prior experience with one natural disaster, Winter Storm Uri, and risk perceptions of climate change on support for climate change mitigation policy. The research objectives were as follows:

RO1: Describe the respondents' prior experience with Winter Storm Uri, their perceptions toward climate change, and their support of policy to mitigate climate change

RO2: Determine how the respondents' prior experience with Winter Storm Uri, their demographic characteristics, and their perceptions toward climate change predict their support of policy to mitigate climate change

Methodology

An online survey research instrument was used to explore Texas residents' prior experience of Winter Storm Uri, their perceptions of climate change, and their support of climate change mitigation policy. To do so, we consulted a third-party company, Qualtrics, to obtain a non-probability, opt-in sample of Texas residents aged 18-years or older. Non-probability sampling has been defined as a technique that uses non-random ways to select specific populations to participate in research through incentives for participating in the study such as cash, gift cards, or prizes (Qualtrics, 2022; Lamm & Lamm, 2019). Typically, potential respondents will "opt-in or sign up to be a part of a pool of individuals that may be contacted when a group needs respondents" (Lamm & Lamm, 2019, p. 54). To ensure representation of specific demographic characteristics, researchers will ask for specific demographic quotas to be met through the sampling of these opt-in respondents (Lamm & Lamm, 2019).

Previous researchers have used non-probability sampling techniques to make population estimates (Baker et al., 2013), and it has previously been used to explore and examine public opinion to emerging issues. This sampling procedure is also appropriate due to increased access to the internet, relatively low sampling costs, and ease of reaching members of the population of interest (Lamm & Lamm, 2019). Online, non-probability sample techniques provide higher response rates in comparison to probability-based methods used for random digit dialing of landline numbers (Lamm & Lamm, 2019).

For this study, Qualtrics recruited the population of interest through actively managed market research panels and social media platforms. To verify unique responses and ensure validity, Qualtrics employed digital fingerprinting technology and internet protocol (IP) address checks. We specifically developed the quotas for the sample to match census demographics for age (approximately 50% who identify as female, approximately 50% who identify as male), community type (33% rural, 33% suburban, and 33% urban locations). All respondents were required to have lived in Texas during February 2021 when Winter Storm Uri occurred.

An online link to the survey questionnaire was distributed to a total of 553 respondents from October to November of 2021. Respondents who did not complete all items of the survey instrument, those who failed a quality check (i.e., sped through the survey), and those who did not meet our parameters of being Texas residents aged 18-years or older were eliminated from the survey. Useable responses were obtained from 486 respondents. Additional demographic information (e.g., age, ethnicity, income, education, political ideology) was also collected to better describe the respondents and ensure the sample was demographically representative of Texas residents. The respondents had a mean age of 46.66 (*SD* = 16.25), and the additional demographic characteristics of the respondents can be found in Table 1. Non-probability samples have bias and limitations (e.g., potential exclusion, selection, and participation bias), and readers should be cautioned when attempting to generalize the findings of the current study (Lamm & Lamm, 2019).

Table 1

Demographic Characteristics of the Respondents

Demographic Variable	*f*	%
Education		
Some high school	31	6.4
High school graduate	133	27.4
Some college	145	29.8
Two-year degree	51	10.5
Four-year degree	84	17.3
Master's degree	29	6.0
Professional degree	4	0.8
Doctorate	7	1.4

Prefer not to answer	2	0.4
Ethnicity		
Caucasian	337	69.3
Black or African American	54	11.1
Hispanic or Latinx	87	17.9
Asian/Asian-American	14	2.9
Native American/Pacific Islander	16	3.3
Other	7	1.4
I choose not to answer	2	0.4
Gender		
Man	235	48.4
Woman	249	51.2
Non-binary	2	0.4
Income		
Less than $10,000	58	11.9
$10,000 – $19,999	53	10.9
$20,000 – $29,999	73	15.0
$30,000 – $39,999	49	10.1
$40,000 – $49,999	62	12.8
$50,000 – $59,999	49	10.1
$60,000 – $69,999	30	6.2
$70,000 – $79,999	31	6.4
$80,000 – $89,999	15	3.1
$90,000 – $99,999	14	2.9
$100,000 - $149,999	26	5.3
More than $150,000	17	3.5
Prefer not to say	9	1.9
Political Ideology		
Very liberal	48	9.9
Slightly liberal	48	9.9
Moderate	174	35.8
Slightly conservative	73	15.0
Very conservative	102	21.0
Prefer not to answer	41	8.4
Registered to Vote in Texas		
Yes	369	75.9
No	102	21.0
Prefer not to answer	15	3.1
Community Type		
Rural	163	33.5
Urban	172	35.4
Suburban	151	31.1

Instrument

To collect the data, we developed a questionnaire with items adapted from the prior literature, namely Yang et al. (2014) and Demuth (2018), that was distributed via a Qualtrics link to the respondents. A panel of experts consisting of faculty who are experts in science and agricultural communications across the United States reviewed the instrument for face and content validity, content accuracy, clarity of wording, readability, and survey flow (Colton & Covert, 2007). After the development of the instrument, it was pilot tested with 50 respondents to ensure reliability of the adapted and developed scale items. All scales were found to be reliable with a Cronbach $\alpha > .80$, and we continued with the data collection procedures. After completing the university-approved Institutional Review Board (IRB) consent, the respondents were asked a series of questions. Three sections of this researcher-developed questionnaire were used for the primary data analysis in this study: 1) prior experience with Winter Storm Uri, 2) climate change risk perceptions, and 3) support for climate change mitigation policy.

Prior Disaster Experience with Winter Storm. The existing literature on prior experience to a disaster indicates it is a multi-faceted phenomenon that includes four dimensions: *risk awareness, risk personalization, impacts,* and *emotional affect* (Demuth, 2018). Each of these items were adapted from Demuth's (2018) study exploring prior hazard experience to tornado hazards.

The construct of *risk awareness* (Cronbach $\alpha = 0.87$), or the individual's level of awareness to information and social cues pertaining to the possibility of a hazard occurring, was measured via a 5-point Likert scale (1 = *Very untrue of me*, 2 = *Untrue of me*, 3 = *Neutral*, 4 = *True of me,* 5 = *Very true of me)* to the statement, "Based on your experience with the 2021 winter storm, please indicate the extent to which the following statements reflect you." The items were the following: 1) I paid attention to forecasts and warnings, because I knew about the threat of the winter storm, 2) I was concerned about the threat of the winter storm, 3) People I know talked to me about the threat of the winter storm, and 4) People I know were concerned about the threat of the winter storm.

Risk personalization (Cronbach $\alpha = .81$), or the individual's perception that they could be impacted by a potential hazard, was also measured via a 5-point Likert scale (1 = *Very true of me,* 2 = *Untrue of me,* 3 = *Neutral,* 4 = *True of me,* 5 = *Very true of me)* to the statement, "Based on your experience with the 2021 winter storm, please indicate the extent to which the following statements reflect you." The items included the following: 1) I tried to take action to protect myself or my loved ones (or vice versa), 2) I tried to get to my loved ones to be with them (or vice versa), 3) I feared for my loved ones, 4) I worried about my home.

Impacts (Cronbach $\alpha = .90$), or the individual's perception of the personal or vicarious experiences experienced during the storm, were also measured via a 5-point Likert scale (Likert scale (1 = *Very true of me,* 2 = *Untrue of me,* 3 = *Neutral,* 4 = *True of me,* 5 = *Very true of me*) to the statement, "Based on your experience with the 2021 winter storm, please indicate the extent to which the following statements reflect you." The items included the following: 1) People I know had damage to their property, 2) People I know lost irreplaceable items, 3) The lives of people I know were disrupted afterward, 4) People talked to me about what they experienced.

*Emotional response (*Cronbach $\alpha = .90$), or the individual's perceived negative emotional reaction to the disaster, was measured via a 5-point bipolar to the statement, "During the 2021 winter storm, what where your levels of the four emotions listed below?" The items included the following: 1) *Not very concerned/ Very concerned*, 2) *Not very fearful/Very fearful*, 3) *Not very anxious/very anxious*, and 4) *Not very worried/Very worried.*

Climate Change Risk Perceptions. To measure climate change perceptions, we used three items to assess the respondents' perceptions of the phenomenon: 1) climate change risk perceptions, perceived issue salience, and negative emotional affect based on the prior literature exploring perceptions of climate change (Yang et al., 2014).

Perceived severity (Cronbach α = .95) was measured based on the respondents' perceptions of the severity of the impacts of climate change. These items were based on a 5-point Likert scale (1 = *None at all*, 2 = *A little*, 3 = *A moderate amount*, 4 = *A lot*, 5 = *A great deal*) to the statement "How much do you think climate change will impact the following?" and the items 1) you and your family, 2) your local community, 3) the United States as a whole, 4) People all over the world, 5) Nature (not including humans).

Perceived issue salience (Cronbach α = .95), the respondents' perceptions of the degree in which they viewed climate change of an issue of importance, interest, or relevance to them (Yang et al., 2014), was measured using a 5-point bipolar. Respondents were asked to select their views by responding to "To me, the topic of climate change is _____." to the following statements: 1) *Not very important/very important*, 2) N*ot very relevant/very relevant*, and 3) O*f no concern to me/of concern to me*).

Perceived Negative Emotional Affect (Cronbach α = .87), the degree in which respondents felt negatively emotionally affected, was measured with a 5-point bipolar to the statement "To me, the topic of climate change makes me feel _____." to the items: 1) *Not very worried/very worried*, 2) *Not very sad/very sad*, and 3) N*ot very guilty, very guilty*.

Climate Change Mitigation Policy Support. Policy support (Cronbach α = .88) was measured by assessing the respondents' perceptions of climate change mitigation policies (Yang et al., 2014). To do so, the respondents were given a series of 5-point Likert scale items (1 = *Strongly oppose*, 2 = *oppose*, 3 = *unsure*, 4 = *support*, 5 = *Strongly support*) to respond to the question, "To what degree do you support or oppose the following policy proposals." The policy proposals were the following: 1) Regulate carbon dioxide as a pollutant, 2) Require electric utilities to produce at least 20% of their electricity from wind, solar, or other renewable sources, even if it costs the average household an extra $100 a year, 3) require automakers to increase the fuel efficiency of cars, trucks, and sport-utility vehicles to 54.5 miles per gallon, even if means that a new vehicle will cost up to $1,000 more to buy, 4) Fund more research into renewable energy sources, such as solar and wind power, and 5) Provide tax rebates for people who purchase energy efficient vehicles or solar panels.

Data Analysis

After data collection, data were exported to Statistical Package for the Social Sciences (SPSS) Version 28. Research objective one was assessed via descriptive statistics. The real limits were used to interpret the descriptive statistics were the following: 1 – 1.49 (*Disagree)*, 1.5-2.49 (*Somewhat Disagree)*, 2.5-3.49 (*Neither Agree nor Disagree)*, 3.5-4.49 (*Somewhat Agree*), 4.5 – 5 (*Agree)*. Research objective 2 was assessed via multiple linear regression after the data were checked for assumptions following Field's (2016) statistical procedures.

Results

RO1: Describe the respondents' prior experience with Winter Storm Uri, their perceptions toward climate change, and their support of policy to mitigate climate change.

The respondents were asked a series of questions relating to their *prior experience* (Demuth, 2018) toward a disaster. The respondents agreed that they were aware of the risks of

Winter Storm Uri (*M* = 3.97, *SD* = .92), agreed that they believed the storm to personally influence them (*M* = 3.79, *SD* = .93), agreed that Winter Storm Uri impacted those around them (*M* = 3.57, *SD* = 1.04), and they had a negative emotional response to the storm (*M* = 3.67, *SD* = 1.10).

In addition, the respondents were asked a series of questions to understand their *risk perceptions* toward climate change. The respondents neither agreed nor disagreed regarding climate change severity, or that climate change would harm themselves or others (*M* = 3.04, *SD* = 1.06). Respondents neither agreed nor disagreed that they felt a negative affect toward climate change (*M* = 3.10, *SD* = 1.24); however, the respondents agreed that climate change was an important, salient issue (*M* = 3.64, *SD* = 1.37). The respondents had varying support toward climate change mitigation policies (*M* = 3.39, *SD* = 1.01).

RO2: Determine how the respondents' prior experience with Winter Storm Uri, their demographic characteristics, and their perceptions toward climate change predict their support of policy to mitigate climate change

A hierarchical linear regression was used to fulfill objective two. Model one examined *risk perceptions of climate change* as a predictor for the respondents *support for climate change mitigation policy*. The first model was found to be significant, $R^2 = .427$, $F(12, 477) = 44.36$, $p < .001$, and explained 42.7% of the variance, a large effect size (see Table 2; Kotrlik et al., 2011). We found the variables of perceived severity of climate change (β =.14, $p < .001$), negative emotional response toward climate change (β =.29, $p < .001$), and political ideology (β = -.084, $p < .002$) to be significant contributions to the model. As perceived severity of climate change and the emotional response toward climate change increased, we found an increase in support for policy. Additionally, we found respondents who were more liberal had a greater support for climate change policy.

The measures for prior experience were added to the second regression model to determine how the influence of *prior disaster experience* and the respondents' *risk perceptions of climate change* could predict their *support of climate change mitigation policy*. The addition of the prior experience variables increased the overall fit of the model by .021 ($\Delta R^2 = .021$, $F(12, 473) = 31.90$, $p < .001$, $R^2 = .447$), and it explained 44.7% of the variance, a large effect size (see Table 2; Kotrlik et al., 2011). Five predictor variables were included in the second model: prior experience: disaster impacts (β =.082, $p < .039$) and emotional response (β =-.14, $p < .001$); climate change risk perceptions: perceived severity (β =.14, $p < .001$), perceived salience (β =.32, $p < .001$), and perceived negative emotional affect (β =.14, $p < .02$); and political ideology (β =-.081, $p < .003$) (Table 2). In this model, we found increased personal disaster impacts of Winter Storm Uri, perceived severity of climate change, and negative emotional response toward climate change increased support for policy. Additionally, we still found as the respondents were more liberal their support for climate change policy increased. However, we found as the emotional response to Winter Storm decreased, or the respondents became less worried about the storm, the more they would support climate change policy initiatives.

Table 2

Influences on Support for Climate Change Policy

	Model 1					Model 2				
Variables in Regression Model	β	Std. Error	*t*	Std. β	*p*	β	Std. Error	*t*	Std. β	*p*
Constant	1.994	.241	8.265		<.001**	1.847	.275	6.72		<.001**
Prior Disaster Experience										
Risk Awareness						.086	.049	1.77	.079	.078
Risk Personalization						-.033	.055	-.60	-.031	.546
Disaster Impacts						.082	.039	2.07	.084	.039*
Emotional Affect						-.141	.041	-3.46	-.15	<.001**
CC Risk Perceptions										
CC Perceived Severity	.143	.044	.151	.151	.001**	.14	.044	3.21	.15	.001**
CC Perceived Salience	.092	.049	.113	.113	.058	.32	.046	6.85	.43	<.001**
CC Emotional Response	.292	.046	.395	.395	<.001**	.11	.048	2.29	.14	.02*
Demographics										
Political Ideology	-.084	.027	-3.08	-.117	.002*	-.081	.027	-2.96	-.12	.003*
Education	.047	.026	1.85	.072	.065	.035	.026	1.37	.053	.17
Household Income	-.005	.012	-.38	-.015	.71	-.002	.012	-.19	-.007	.85
Gender	-.108	.072	-1.49	-.054	.136	-.092	.071	-1.30	-.046	.20
Rural/Urban/Suburban	-.031	.045	-.69	-.025	.491	-.023	.045	-.522	-.019	.60
R^2	.427					.447				
F	44.36				<.001**	31.90				<.001**
ΔR^2						.021				
ΔF						4.44				.002*

Note: * p < .05, ** < .001; Model 1: R^2 = .427, F(12, 477) = 44.36, p < .001; Model 2: R^2 = .447, F(12, 473) = 31.90, p < .001

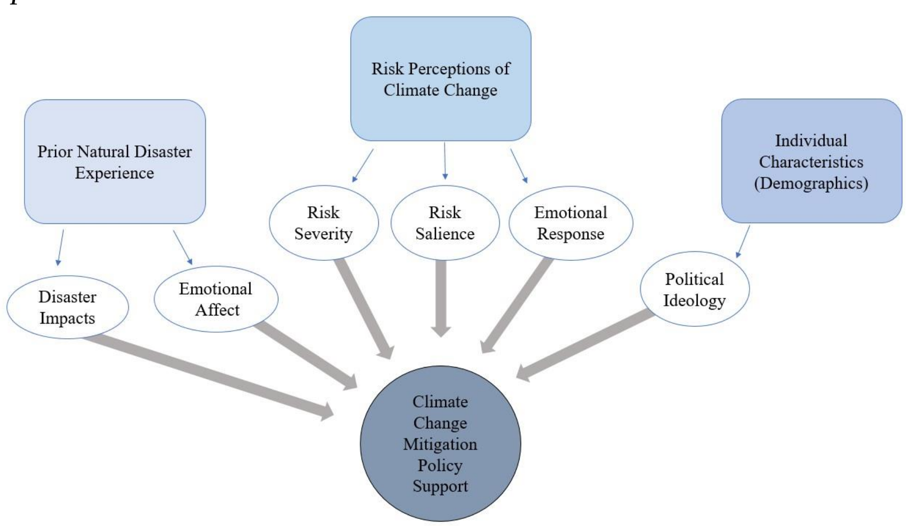
Conclusions & Implications

The scientific consensus suggests that severe weather has been scientifically linked to climate change (Wuebbles et al., 2014) and has an immediate impact on the public and the agricultural sector (UNFCC, 2021). Although academic conversations in agricultural communications have started to explore the topic of climate change, there is more research needed in this area to fully investigate this dynamic and complex phenomena. This study adds to the climate change communication literature by exploring the implications of individuals' prior experience with one natural disaster, their risk perceptions of climate change, and individual characteristics on policy support toward climate change mitigation.

We conducted two hierarchal linear regression models to examine the influence of *prior disaster experience, climate change risk perceptions*, and *demographics* on support for climate change mitigation policy. Our first model indicated when the respondents perceived climate change to be severe, or that the impacts of climate change were severe, and when they had a negative emotional reaction to climate change, the more likely they were to support climate change mitigation policy. Our second hierarchical linear regression examined how the addition of prior disaster experience with Winter Storm Uri influenced their decision making to support climate change mitigation policy. We found that in addition to the perceived severity and emotional response toward climate change (found in Model 1), the respondents perceived salience or importance of climate change, perception of the impact of Winter Storm Uri, and their emotional affect toward the storm were also contributors to the model. It is also important to note that the only demographic variable that contributes to each of the models was political ideology. We found as the respondents leaned more politically liberal, the more likely they were to support these policy efforts, as Yang et al. (2014) also found and other scholarship (e.g., Leiserowitz et al., 2019; McCright & Dunlap, 2011) also indicated would be likely. Overall, these findings support our conceptual framework emphasizing the role of prior disaster experience as a contributor to the cognitive process that unfolds when individuals arrive at decisions and attitudes regarding risk (Figure 2).

Figure 2

Revised conceptual model.



It is important to note that prior disaster experience is an important contributor to the model; however, it accounts for a small amount of variance in comparison to climate change risk perceptions ($\Delta R^2 = .021$). In both models, our results suggest that the main contributors were dimensions of the climate change risk perceptions (perceived severity (Model 1: Std. $\beta = .14$; Model 2: Std. $\beta = .14$), emotional response (Model 1: Std. $\beta = .29$; Model 2: Std. $\beta = .11$), and political ideology (Model 1: Std. $\beta = -.084$; Model 2: Std. $\beta = -.081$).

We attribute these findings to *three* factors. *First*, climate change risk perceptions were the strongest contributors to the model. Perhaps this finding is indicative of the mental structure of individual belief systems, that is, people hold strong and lasting beliefs about the potential risks (Renn, 1998) and much deliberation occurs when beliefs are challenged (Fischoff et al., 1992). Considering the polarizing nature of climate change, these risk perceptions were developed over a lifetime through a variety of different frames of references resulting from multiple past experiences (Brown, 2014). Additionally, political ideology was a strong contributor to both models 1 and 2. Considering the political polarization of climate change (Leiserowitz et al., 2019), it is not surprising that someone's political ideology predicted their likelihood to support climate change mitigation policy, as support for initiatives of this nature tends to divide unevenly over party lines (Hoffman et al., 2011a,b; Yang et al., 2014).

Second, we examined the impact of one disaster, Winter Storm Uri. In this model, the respondents had engrained belief systems toward climate change and support for policy to mitigate its effects. Although exposure to a disaster may spark individuals to take action to protect themselves against future hazards (Yang et al., 2014), these risk perceptions were too strong to change the respondents' support these policy measures.

Lastly, these findings may be attributed to the nature of the disaster these respondents experienced. It was apparent that our respondents were somewhat aware of the risks ($M = 3.97$), how the risks might impact them personally ($M = 3.79$), and the impacts of the storm ($M = 3.57$), and the storm generated a negative response ($M = 3.67$). Although this storm caused major power outages and financial losses to the state (Golding et al., 2021; Donald, 2021; NOAA, 2022), the personal devastating impacts may have been minimal. In addition, we may have seen prior disaster experience only account for a small amount of the variance due to the timing of this study. Although this study was completed during 2021, it was conducted approximately nine months after the event. If this study was conducted immediately after Winter Storm Uri, would it have been easier for the respondents to recall the events of the storm, or feel like they were more affected by the storm?

Despite this limitation, we found the prior disaster experience variables to provide an interesting contribution to this model. As the respondents had more personal and vicarious impacts or these impacts increased, their support for climate change mitigation policy also increased. This finding may suggest that the more the individual is impacted by a natural disaster, the more it may provoke an individual to view the natural disaster and connect it to climate change (Irfan, 2021), thus warranting support for mitigation. This finding may relate to questions posed by both scientists and the media surrounding controversy among climate researchers about how severe weather events are becoming more common and may be contributed to climate change (Irfan, 2021; Machemar, 2021). In addition, prior disaster experience has been theoretically linked to the notion that when an individual is exposed to a disaster, they are much more likely to protect themselves from future events (Demuth 2018; Yang et al., 2014). This link may provide reasoning as to why as the disaster impacts increased, support for climate change mitigation policy also increased. Support for this type of mitigation policy provides an avenue for the individual to attempt to protect themselves for similar events. Finally, since we do see these disaster impacts as a contributor to this model, it may also suggest that individuals may have more concrete views on the risks of climate change, as they have personally experienced this risk and may now see the impacts on climate change on their lives.

It is also important to note that views of climate change are complex, like the topic of climate change. To address this complexity, this study drew from prior research in science communication (Demuth, 2018; Yang et al., 2014) to understand the complexity of the risk perceptions surrounding this topic. These measures allowed us to understand how the respondents perceived the risks of the severity of climate change, their level of perceived issue salience, and their perceived negative emotional affect. These constructs allow researchers to explore the complex phenomena that are individual perceptions and their dimensions. Our findings suggested views of perceived severity and emotional response to climate change were major contributors to supporting climate change mitigation policy in our model. Therefore, as an individual views the risks of climate change to be more severe and the more that they view it as an important, salient topic, the more likely the individual is to support climate change mitigation policy. Indeed, these findings support prior literature suggesting risk perceptions hold multiple dimensions that inform decision making and behavior (Paek & Hove, 2016; Penning & Grossman, 2008). As an individual recognizes a risk and deems it to be a threat, the individual is more likely to respond, such as taking protective action or supporting mitigation policy (Becker et al., 2017; Yang et al., 2014).

Recommendations

It was apparent that prior disaster experience was a contributor to our model. Therefore, we suggest future research should explore the role of prior disaster experience with other natural disasters with more long term, structural impacts, and immediate, personal losses to the public. For example, research could seek to understand the public's experiences with other severe weather events such as wildfires, tornadoes, or hurricanes to determine how these disaster events are linked with support for mitigation policy and their risk perceptions. Perhaps such events may have a stronger impact on their decisions and judgements. This study also explored the dimensions of climate change regarding respondents’ perceived severity, salience, and emotional affect. However, there are a multitude of other constructs within this topic that could be explored with public opinion. For example, researchers should seek to understand the implications of climate change views (i.e., perceiving climate change is occurring due to anthropogenic causes, natural changes, or not all) and trust in science on climate change mitigation policy support and other outcomes. We recommend agricultural and environmental communicators apply these concepts of prior disaster experience and risk perception toward an exploration of climate change perceptions and risk information seeking and processing (Yang et al., 2014) through both research and practice. In addition, researchers should seek to apply audience segmentation techniques to understand how varying audiences perceive the risks of climate change and cluster into groups (i.e., target audiences). These segmentation techniques could allow researchers to pinpoint how these individual characteristics are shared by multiple groups, and it could help to improve strategic communication about this complex phenomenon.

In addition to the need for academic conversations to explore the public perception of climate change, agricultural communicators and educators also need to continue the conversation about climate change. However, communicators should be mindful of how they craft and develop their messaging about this controversial topic. Our findings suggest that understanding prior disaster experience and climate change risk perceptions are important when an individual decides to support climate change mitigation policy. Perhaps, due to the impact of prior disaster experience, climate change mitigation messaging should also expand upon and emphasize the local impact of the risks of climate change. The inclusion of the local impact may make messaging more relevant to individuals, as it could provide a way to highlight the local risks and make this topic more personally relevant to the chosen audience, as supported by Lee and Cameron (2007) and Jones et al. (2017).

References

Baker, R., Brick, J. M., Bates, N.A., Battaglia, M., Couper, M.P., Dever, J. A., Gile, K. J., & Tourangeau, R. (2013). Report of the AAPOR task force on non-probability sampling. *American Association for Public Opinion Research.* https://pdfs.semanticscholar.org/7f46/2faf52ad1348fdaa4a073c202baf373e1f1b.pdf

Becker, J. S., Paton, D., Johnston, D. M., Ronan, K. R., & McClure, J. (2017). The role of prior experience in informing and motivating earthquake preparedness. *International Journal of Disaster Risk Reduction, 22*, 179-193. https://doi.org/10.1016/j.ijdrr.2017.03.006

Bergquist, M., Nilsson, A., & Schultz, P. (2019). Experiencing a severe weather event increases concern about climate change. *Frontiers in Psychology, 10*, 220. https://doi.org/10.3389/fpsyg.2019.0022

Brown, V. J. (2014). Risk perception: It's personal. *Environmental Health Perspectives, 122*(10), A276-A279. https://doi.org/10.1289/ehp.122-A276

Carlton, J. S., Mase, A. S., Knutson, C. L., Lemos, M. C., Haigh, T., Todey, D. P., & Prokopy, L. S. (2016). The effects of extreme drought on climate change beliefs, risk perceptions, and adaptation attitudes. *Climatic Change, 135*, 211-226. https://doi.org/10.1007/s10584-015-1561-5

Chinn, S., Hart, P. S., & Soroka, S. (2020). Politicization and Polarization in Climate Change News Content, 1985-2017. *Science Communication, 42*(1), 112-129. https://doi-org.lib-e2.lib.ttu.edu/10.1177%2F1075547019900290

Cohen, J., Zhang, X., Francis, J., Jung, T., Kwok, R., Overland, J., Ballinger, T. J., Bhatt, U. S., Chen, H.W., Coumou, D., Feldstein, S., Gu, H., Hanford, D., Henderson, G., Ionita, M., Kretschmer, M., Laliberte, F., Lee, S., Linderholm, W., Maslowski, W., Peings, Y., Pfeiffer, K., Rigor, I., Semmler, T., Stroeve, J., Taylor, P.C., Vavrus, S., Vihma, T., Wang, S., Wendisch, M., Wu, Y., & Yoon, J. (2020). Divergent consensuses on Arctic amplification influence on midlatitude severe winter weather. *National Climate Change, 10*, 20-29. https://doi.org/10.1038/s41558-019-0662-y

Colton, D., & Covert, R. (2007). *Designing and constructing instruments for social research and evaluation*. Jossey-Bass.

Demuth, J. L. (2018). Explicating experience: Development of a valid scale of past hazard experience for tornadoes. *Risk Analysis, 38*(9), 1921-1943. https://doi.org/10.1111/risa.12983

Detenber, B. H., & Rosenthal, S. (2020). Climate change audience segmentation: an international review. *Research handbook on communicating climate change*, 214-229. https://doi.org/10.4337/9781789900408.00033

Donald, J. (2021). *Winter Storm Uri 2021: The economic impact of the storm*. Comptroller Texas. https://comptroller.texas.gov/economy/fiscal-notes/2021/oct/winter-storm-impact.php

Doss-Gollin, J., Farnham, D. J., Lall, U., Modi, V. (2021). How unprecedented was the February 2021 Texas cold snap? *Environmental Research Letters, 16*. https://iopscience.iop.org/article/10.1088/1748-9326/ac0278#:~:text=The%20inferred%20heating%20demand%20per,are%20comparable%20for%20longer%20durations.

Drews, S., & Van Den Bergh, J. (2015). What explains support for climate policies? A review of empirical and experimental studies. *Climate Policy, 16*(7), 855-876. https://doi.org/10.1080/14693062.2015.1058240

Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, *49*(8), 709. https://doi.org/10.1037/0003-066X.49.8.709

Environmental Protection Agency (EPA). (2021). *Climate change indicators: Weather and climate*. https://www.epa.gov/climate-indicators/weather-climate#:~:text=Scientific%20studies%20indicate%20that%20extreme,with%20human%2Dinduced%20climate%20change

Fischoff, B., Bostrom, A., & Jacobs-Quadrel, M. (1993). Risk perception and communication. *Annual Review of Public Health, 14*, 183-203. https://www.annualreviews.org/doi/pdf/10.1146/annurev.pu.14.050193.001151

Gerland, S., Barber, D., Meier, W., Mundy, C. J., Holland, M., Kern, S., Li, Z., Michel, C., Perovich, D. K., & Tamura, T. (YEAR?). Essential gaps and uncertainties in the understanding of the roles and functions of Arctic sea ice. *Environmental Research Letters, 14*(4). https://iopscience.iop.org/article/10.1088/1748-9326/ab09b3

Glazer, Y. R., Tremaine, D. M., Banner, J. L., Cook, M., Mace, R. E., Nielsen-Gammon, J., Grubert, E., Kramer, K., Stoner, A. M. K., Wyatt, B. M., Mayer, A., Beach, T., Correll, R., & Webber, M. E. (2021). Winter Storm Uri: A test of Texas' water infrastructure and water resource resilience to extreme winter weather events. *Journal of Extreme Events, 8*(1). https://doi.org/10.1142/S2345737621500226

Golding, G., Kumar, A., & Mertens, K. (2021). *Cost of Texas' 2021 deep freeze justifies weatherization.* Federal Reserve Bank of Dallas. https://www.dallasfed.org/research/economics/2021/0415.aspx

Greening, L., Dollinger, S. J., & Pitz, G. (1996). Adolescents' perceived risk and personal experience with natural disasters: An evaluation of cognitive heuristics. *Acta Psychologica*, *91*(1), 27-38. https://doi.org/10.1016/0001-6918(94)00040-9

Griffin, R. J., Dunwoody, S., & Neuwirth, K. (1999). Proposed model of the relationship of risk information seeking and processing to the development of preventive behaviors. *Environmental research*, *80*(2), S230-S245. https://www.researchgate.net/profile/Sharon-Dunwoody/publication/268036072_A_Proposed_Model_of_the_Relationship_of_Risk_Information_Seeking_and_Processing_to_the_Development_of_Preventive_Behaviors/links/5715077b08ae3a8d5400423f/A-Proposed-Model-of-the-Relationship-of-Risk-Information-Seeking-and-Processing-to-the-Development-of-Preventive-Behaviors.pdf

Gross, M. H., Donat, M. G., Alexander, L.V., & Sherwood, S.C. (2020). Amplified warming of seasonal cold extremes relative to the mean in the Northern Hemisphere extratropics. *Earth System Dynamics*, *11*(97–111). https://esd.copernicus.org/articles/11/97/2020/

Halpern-Felsher, B. L, Millstein, S. G., Ellen, J. M., Adler, N. E., Tschann, J. M., & Biehl, M. (2001). The role of behavior experience in judging risks. *Health Psychology*, *202*(2), 120-126. https://psycnet.apa.org/doi/10.1037/0278-6133.20.2.120

Heath, R. L. & Palenchar, M. (2000). Community relations and risk communication: A longitudinal study of the impact of emergency response messages. *Journal of Public Relations Research*, *2*, 131-161. https://doi.org/10.1207/S1532754XJPRR1202_1

Hine, D. W., Reser, J. P., Morrison, M., Phillips, W. J., Nunn, P., & Cooksey, R. (2014). Audience segmentation and climate change communication: Conceptual and methodological considerations. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(4), 441-459. https://wires-onlinelibrary-wiley-com.lib-e2.lib.ttu.edu/doi/pdf/10.1002/wcc.279

Hoffman, A. J. (2011a). Talking Past Each Other? Cultural Framing of Skeptical and Convinced Logics in the Climate Change Debate. *Organization & Environment*, *24*(1), 3-33. https://doi.org/10.1177/1086026611404336

Hoffman, A. J. (2011b). The culture and discourse of climate skepticism. *Strategic Organization*, *9*(1), 77-84. https://doi.org/10.1177/1476127010395065

Irfan, U. (February 18, 2021). *Scientists are divided over whether climate change is fueling extreme cold events.* Vox. https://www.vox.com/22287295/texas-uri-climate-change-cold-polar-vortex-arctic

Jones, C., Hine, D. W., & Marks, A. D. (2017). The future is now: Reducing psychological distance to increase public engagement with climate change. *Risk Analysis*, *37*(2), 331-341. https://onlinelibrary.wiley.com/doi/pdf/10.1111/risa.12601

Kotrlik, J. W., Williams, H. A., & Jabor, K. M. (2011). Reporting and interpreting effect size in quantitative agricultural education research. *Journal of Agricultural Education, 52*(1),132-142. https://doi.org/10.5032/jae.2011.01132

Lamm, A. J., & Lamm, K. W. (2019). Using non-probability sampling methods in agricultural and extension education research. *Journal of International Agricultural and Extension Education, 26*(1), https://doi.org/10.5191/jiaee.2019.26105

Lee, J. J., & Cameron, T. A. (2007). Popular support for climate change mitigation: Evidence from a general population mail survey. *Environmental Resource Economics, 41*, 223-248. https://doi.org/10.1007/s10640-007-9189-1

Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C. Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. *Nature Climate Change, 5*(11), 1014-1020. https://doi.org/10.1038/nclimate2728

Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change, 77*, 45-72. https://doi.org/10.1007/s10584-006-9059-9

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Ballew, M., Goldberg, M., Gustafson, A., & Bergquist, P. (2019). *Politics & Global Warming, April 2019. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication. https://osf.io/nbjgs/*

Lu, H., & Schuldt, J. P. (2016). Compassion for climate change victims and support for mitigation policy. *Journal of Environmental Psychology, 45*, 192-200. https://doi-org.lib-e2.lib.ttu.edu/10.1016/j.jenvp.2016.01.007

Machemer, T. (2021). *How Winter Storm Uri impacted the United States.* Smithsonian Magazine. https://www.smithsonianmag.com/smart-news/how-winter-storm-uri-has-impacted-us-180977055/

Mayfield-Smith, K., Lamm, A., Masambuka-Kanchewa, F., Borron, A., & Holt, J. (2021). Arguing for argument's sake? Exploring public conversations around climate change on Twitter. *Journal of Applied Communications, 105*(4). https://doi.org/10.4148/1051-0834.2382

Mbow, C., C. Rosenzweig, L.G. Barioni, T.G. Benton, M. Herrero, M. Krishnapillai, E. Liwenga, P. Pradhan, M.G. Rivera-Ferre, T. Sapkota, F.N. Tubiello, & Y. Xu. (2019). Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. *Food Security*. https://www.ipcc.ch/site/assets/uploads/sites/4/2021/02/08_Chapter-5_3.pdf

McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001-2010. *The Sociological Quarterly*, *52*, 155-194. https://doi.org/10.1111/j.1533-8525.2011.01198.x

NASA. (2022). *Responding to climate change.* https://climate.nasa.gov/solutions/adaptation-mitigation/

National Climate Task Force. (2022). *President Joe Biden's Actions to Tackle the Climate Crisis.* The White House. https://www.whitehouse.gov/climate/#:~:text=Reducing%20U.S.%20greenhouse%20gas%20emissions,clean%20energy%20to%20disadvantaged%20communities

NOAA National Centers for Environnemental Information (NCEI). (2022). *U.S. billion-dollar weather and climate disasters*. https://www.ncdc.noaa.gov/billions/

Paek, H., & Hove, T. *Risk Perceptions and Risk Characteristics*. Oxford Research Encyclopedia of Communication. https://oxfordre.com/communication/view/10.1093/acrefore/9780190228613.001.0001/acrefore-9780190228613-e-283

Pennings, J. M. E., & Grossman, D. B. (2008). Responding to crises and disasters: The role of risk attitudes and risk perceptions. *Disasters, 32*(3), 434-448. https://doi.org/10.1111/j.1467-7717.2008.01048.x

Renn, O. (1998). The role of risk perception for risk management. *Reliability Engineering and System Safety, 59*(1), 49-62. https://doi.org/10.1016/S0951-8320(97)00119-1

Rehani, M. M. (2015). Radiation effects and risks: Overview and a new risk perception index. *Radiation Protection Dosimetry*, *165*(1-4), 7-9. https://doi.org/10.1093/rpd/ncv117

Roeser, S. (2012). Risk communication, public engagement, and climate change: A role for emotions. *Risk Analysis: An International Journal*, *32*(6), 1033-1040. https://doi.org/10.1111/j.1539-6924.2012.01812.x

Sloan, M. (2021). *Global warming's six Americas.* Yale Program on Climate Change Communication. https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/

Slovic, P. & Peters, E. (2006). Risk perception and affect. *Current Directions in Psychological Science, 15*(6), 322-325. https://doi.org/10.1111%2Fj.1467-8721.2006.00461.x

Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. (2011). Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change*, *1*, 46-49. https://doi.org/10.1038/nclimate1059

Sullivan, B. (2021). *Texas deep freeze could cost $90 billion in losses, modeler says*. Bloomberg. https://www.bloomberg.com/news/articles/2021-02-24/texas-deep-freeze-could-cost-90-billion-in-losses-modeler-says#xj4y7vzkg

Texas Department of State Health Services. (December 2021). *February 2021 winter storm-related deaths – Texas.* Texas Health and Human Services. https://www.dshs.texas.gov/news/updates/SMOC_FebWinterStorm_MortalitySurvReport_12-30-21.pdf

Texas Energy ERCOT. About ERCOT. https://www.ercot.com/about

Tribbia, J. (2007). *Stuck in the slow lane of behavior change? A not-so-superhuman perspective on getting out of cars.* In S. C. Moser & L. Dilling (Eds.), *Creating a Climate for Change* (pp. 237-250). Cambridge.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*(4157), 1124-1131. https://science.sciencemag.org/content/185/4157/1124.abstract

Tyson, A. & Kennedy, B. *Two-thirds of Americans think government should do more on climate.* Pew Research Center. https://www.pewresearch.org/science/2020/06/23/two-thirds-of-americans-think-government-should-do-more-on-climate/

The University of Texas at Austin: Energy Institute. (July 2021). *The timeline and events of the February 2021 Texas electric grid blackouts.* https://energy.utexas.edu/sites/default/files/UTAustin%20%282021%29%20EventsFebruary2021TexasBlackout%2020210714.pdf

United Nations Framework Convention on Climate Change (UNFCCC). (2021*). Climate change-related disasters a major threat to food security – FAO.* https://unfccc.int/news/climate-change-related-disasters-a-major-threat-to-food-security-fao#:~:text=The%20report%20identifies%20drought%20as,pests%20and%20diseases%2C%20and%20wildfires.&text=Drought%20impacts%20agriculture%20almost%20exclusively,18%25%20in%20all%20other%20sectors

USDA National Institute of Food and Agriculture. (2022, January). *USDA invests $9M to expand reach and increase adoption of climate-smart practices.* https://content.govdelivery.com/accounts/USDANIFA/bulletins/305511b

U.S. Department of Energy. (February 16, 2021). *Extreme cold & winter weather.* https://www.energy.gov/sites/prod/files/2021/02/f82/TLP-WHITE_DOE%20Situation%20Update_Cold%20%20Winter%20Weather_%231.pdf

Wuebbles, D. J., Kunkel, K., Wehner, M., Zobel, Z. (2014). Severe weather in the United States under a changing climate. *Eos, 95*(18). https://doi.org/10.1002/2014EO180001

Wynes, S., & Nicholas, K. A. (2017). The climate mitigation gap: education and government recommendations miss the most effective individual actions. *Environmental Research Letters*, *12*(7), 074024. https://iopscience.iop.org/article/10.1088/1748-9326/aa7541/pdf

Yang, J. Z., Rickard, L. N., Harrison, T. M., & Seo, M. (2014). Applying the Risk Information Seeking and Processing model to examine support for climate change mitigation policy. *Science Communication*, *36*(3), 296-324. https://doi.org/10.1177/1075547014525350

Zanocco, C., Boudet, H., Nilson, R., & Flora, J. (2019). Personal harm and support for climate change mitigation policies: Evidence from 10 U.S. communities impacted by extreme weather. *Global Environmental Change*, *59*. https://doi-org.lib-e2.lib.ttu.edu/10.1016/j.gloenvcha.2019.101984