

## Citizens' Decision-Making Frameworks on Climate Change Policy Preferences

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### Abstract

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In this study, we examine the effects of two decision styles – one based on knowledge and one based on emotions/affect– on public climate change policy preferences. We argue that the framework itself affects one's policy preferences, even when controlling for risk. We examine this relationship using data from a National Public Climate Change Survey. From this survey of U.S. adults, we determined individuals' levels of perceived knowledge, dread of climate change events, and climate change policy preferences. We find that those scoring high on our assessed knowledge scale are less supportive of mitigation policies, while those scoring high on the perceived knowledge scale prefer mitigation policies. Those scoring high on the emotion/affect-based scale, measured as one's dread of climate change events, are more supportive of mitigation policies. We conclude that including decision-making frameworks in models of climate change policy preferences may help us better predict and understand citizens' preferences.

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**Keywords:** climate change, public policy, decision style, citizen preferences

### 1. Introduction

The ability to accurately predict and understand citizens' policy preferences presents a significant challenge for researchers and policy makers. With many social, economic, and personal variables, it is difficult to isolate the unique factors that affect a person's willingness to support certain policies over others. Understanding and predicting preferences is further hindered because policy preferences are fluid and preferences can change as a person's social, economic, or personal status changes.

Here, we expand our ability to better understand and predict certain policy preferences by including measures of the decision-making frame work of the individual (Leiserowitz, 2005). Individuals have different decision-making styles which include, among other things, strategies in weighing alternatives or trade-offs, examining potential solutions (Luthans, 2010; Pennino, 2002; Rowe, 1987). There are four decision-making models (analytical, conceptual, behavioral, and directive) used within the business literature (Dessaïet al., 2004). The directive model refers to solving a problem by being logical, practical, and systematic—taking a hard look at the facts. The analytical model is the contemplation of every fact, piece of information, and outcomes in order to reach a decision. The conceptual framework tends to rely on intuition, emotions, and affect. Finally, behavioral model base decisions on discussion with others that allow for the use of emotion and facts). We have collapsed the four frameworks into two, given the blurred lines between the four concepts. For example, directive (based on rationality and knowledge) and analytical (based on knowledge and facts) are almost identical styles.

Following the logic outlined above, two fundamental models we will examine are those based on knowledge (facts and perceptions of facts) and those based on emotions (affect) (Leiserowitz, 2006; Milgrom & Roberts, 1992). For those seeking to maximize personal utility, their preferences on policies, in this case climate change policies, should partially be a function of using facts to order their preferences and then choosing the policy option that maximizes their personal utility (Paternotte, 2011; Milgrom & Roberts, 1992). Individuals can also prefer policies based on their emotions related to climate change events and threats (Leiserowitz, 2006).

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Thus, we argue that policy preferences may be better understood if we can identify the relevant decision-making model used in the policy formulation and legitimization stages in the Policy Process Model (Kraft & Furlong, 2018; McCright, Dunlap, & Xiao, 2013). The knowledge-based framework is measured by one's actual and perceived knowledge of the climate change phenomenon. The emotion/affect framework is measured by their affective assessment of climate change events (see Leiserowitz, 2006; Wildavsky & Dake, 1990).

We have chosen these particular models because previous researchers cite one or both as being key factors in one's assessment of risk, and thus one's willingness to support a particular policy (Kraft & Furlong, 2018; Leiserowitz, 2006; Malka, Krosnick, & Langer 2009; O'Connor, Bord, & Fisher, 1999). Given that both frameworks, factual and/or emotional/affect-based, could contain an element of risk<sup>1</sup> assessment, we argue that by examining the decision-style framework itself, rather than the derived risk assessment, we may be able to create a more nuanced theory to predict when a person will or will not support certain policies.

We will examine how these decision frameworks affect citizens' preferences for climate change policies, and more specifically mitigation and adaptation policies. We focus on mitigation and adaptation policies because the vast majority of current national level policies created to address climate change and its associated threats fall under these broad categories (Leiserowitz, 2006). As a result, it is important to know when individuals will support these types of policies as well as when they will not. To examine this relationship, we use data from a National Public Climate Change Survey conducted in The Institute of Science, Technology and Public Policy at Texas A&M University. This survey not only allows us to answer these questions, but also to control for a host of social, political, and economic factors that contribute to a person choosing whether or not to support these policies.

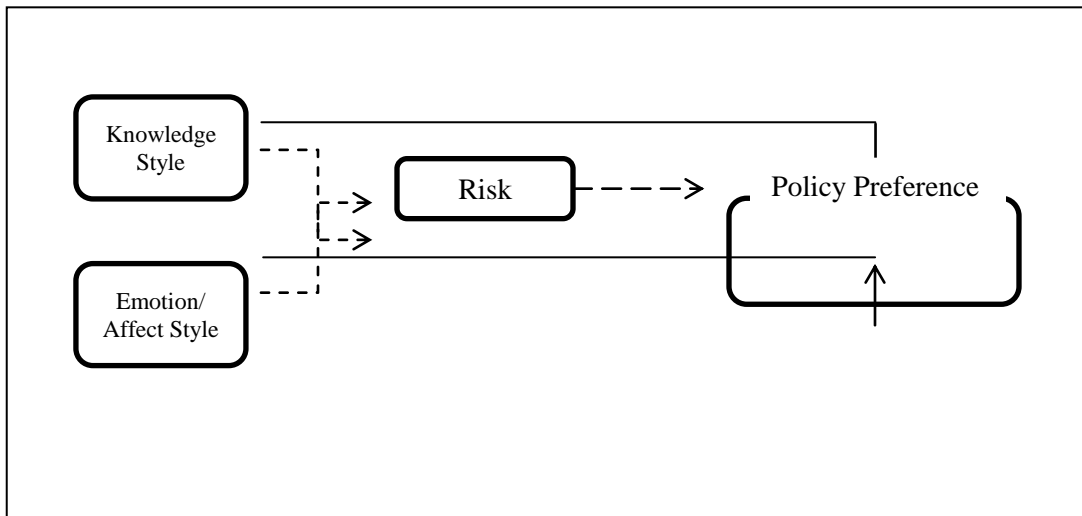
## 2. Literature and Theory

Individual decision-making frameworks are essential for both social scientists and policymakers to understand. These frameworks influence individual's worldviews and are influential in framing an individual's beliefs, values, and norms. Since they help frame an individual's perception of reality, they are fundamental to explaining their actions and public policy preferences (McCright et al., 2013; Myers et al., 2012; O'Connor, Bord, & Fisher, 1999; Reibstein, Lovelock, & Dobson, 1980).

Much research on decision-making models presumes that individuals seek to maximize personal utility (Kraft & Furlong, 2018; Paternotte, 2011; Downs, 1957). Utility theory is founded on the idea of individuals being able to rank their personal preferences based on the information they possess. To determine what will maximize personal utility, people rank order their preferences based on their knowledge and the information they could access (Kraft & Furlong, 2018; Milgrom & Roberts, 1992). Individuals then make behavioral or preference choices based on what they perceive will maximize their benefits and minimize costs.

Critics of using this approach as the only explanation for policy preferences argue that mental processes are not solely founded on a knowledge-based examination of the available facts, but also include other factors like perception, emotion, and affect (Markowitz & Shariff, 2012; Myers et al.; 2012; Slovic; 2000). Past research has demonstrated the important role that emotions and affect play in the decision-making process (Markowitz & Shariff, 2012; Myers et al., 2012). We acknowledge and include these factors in our models as we evaluate the empirical effects of both approaches (Leiserowitz, 2005; Slovic, 2000). Therefore, we take into account two perspectives, one based on knowledge and one based on emotions and affect.

In order to better predict one's policy preferences, we must treat each decision framework as a separate decision-making path. We must account for the knowledge-driven mental processes that affect policy preferences as well as those driven by emotions and affect. In the case of climate change, we can do this by considering how knowledge about a problem as well as how emotions about that problem affect one's support for mitigation policies (Myers et al., 2012; Leiserowitz, 2005; Slovic, 2000). Our model is depicted visually in Figure 1.



**Figure 1** Decision Styles and Policy Preferences

First, it is important to explain our approach to the concept of climate change risk. Note that in Figure 1, we show the underlying presence of risk, but the dotted lines indicate that we will not be highlighting it as the primary factor in this decision system. There is a long line of research demonstrating that risk is an important predictor of one’s climate change policy preferences (Malka et al., 2009; Kane & Shogren, 2000; O’Connor et al., 1999). However, how one comes to define risk is associated with a number of factors, both measurable and unmeasurable. One of those factors may be one’s decision framework. Therefore, we will control for risk and focus, as the model implies, on the primary role of decision making frameworks. This approach is similar to previous studies that have focused on factors such as gender and religion. While gender and religion may also affect one’s risk assessment, they have been studied individually in order to determine their direct effects on climate change policy preferences (McCright et al., 2013).

It is imperative, therefore, that we understand how each decision-making framework affects policy preferences given the potential for each to lead to different degrees of support for climate change policies. The knowledge-based framework can influence the policy preferences of individuals. In the case of climate change for example, scholars have documented that awareness of temperature variations by respondents on the day they were surveyed affects climate change concern levels (Brooks, Oxley, Vedlitz, Zahran, & Lindey, 2014). Implicit or explicit knowledge of real world conditions may provide individuals with information regarding climate change that may shape their climate change policy preferences (Weber & Stern, 2011). The more knowledge one has about climate change, the more likely one may recognize the need for adaptive management policies rather than mitigation ones. This is because adaptive management strategies could be seen as a more rational, proactive step that can be taken by governmental planners, especially at the local and state levels, to reduce the damage likely to occur from climate change effects. As such these policies, as opposed to mitigation ones, could actually provide more protection for an array of possible vulnerabilities.

The use of the emotion/affect based-decision framework, one’s personal feelings of fear and anxiety, whether based on personal experiences or other factors, can also be used to calculate their policy preferences (Markowitz & Shariff, 2012; Myers *et al.*, 2012; Slovic, 2000). People, who fear/dread the increasing occurrences of the weather events associated with climate change, may use their emotions as the basis of their policy preferences given that these events are expected to increase with climate change. It is important to explore the effects of this framework on policy preferences given the destruction caused by Hurricane Harvey and Maria, the tornadoes in Oklahoma, the wildfires on the West Coast, and the increasing severity of the winter storms, and other natural disasters have resulted in the public’s demands for policy change.

Thus, we hypothesize:

*H1: Controlling for risk, those scoring higher on the climate change knowledge-based framework will be less supportive of mitigation policies than those scoring lower on the knowledge style scale.*

*H2: Controlling for risk, those scoring higher on the climate change emotion/affect-based framework will be more supportive of mitigation policies than those scoring lower on the emotion/affect style scale.*

#### 4. Data and Methods

In order to test these hypotheses, we use data from a National Public Climate Change Survey. This survey was conducted to collect data regarding individuals' knowledge of climate change issues, environmental policy preferences, and perceptions regarding the risks and potential threats of climate change. The survey, which was offered in English, was in the field November 13- 26 and resulted in 1,321 completed surveys for a 55.9% completion rate. GfK Custom Research, LLC administered the survey online by drawing a random, representative sample from its web-enabled Knowledge Panel®, a probability-based panel designed to be representative of the U.S. population. The survey participants are representative of U.S. adults regarding age, education, race, income, metropolitan area, and internet access<sup>2</sup>. Descriptive statistics of these measures are presented in Table 1. The median survey completion time was 24 minutes.

Table 1: Descriptive Statistics

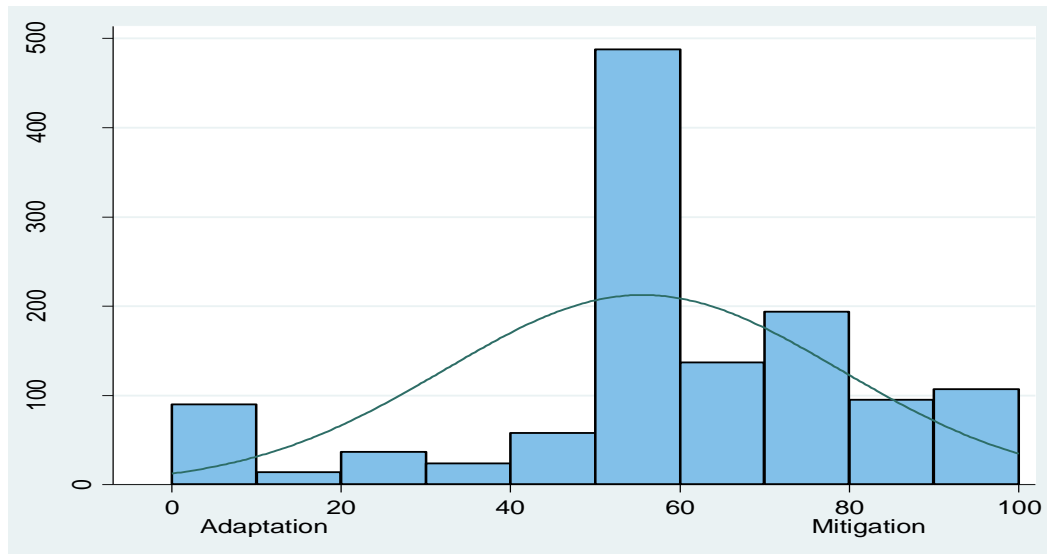
Descriptive Statistics	Mean	S.D.
Policy Preference	55.57	23.34
Actual Knowledge	5.49	1.73
Dread	7.14	2.16
Risk	6.38	2.56
Party Affiliation	4.17	2.12
Political Ideology	4.37	1.69
Religious Participation	2.95	1.60
Environmental Interest Group	0.04	0.19
Age	50.47	16.95
White Non-Hispanic	0.77	0.42
Female	0.52	0.49
Head of Household	0.80	0.39
Household Income	6.42	3.14
Employment Status	0.54	0.49
Internet Access	0.79	0.40
Marital Status	0.56	0.49

As stated above we examine the knowledge-based decision-making framework about environmental policies.<sup>3</sup> Specifically, we focus on policy preferences regarding climate change. The dependent variable of policy preference is derived from responses to a question that asks people how they think the government should allocate money to two different policy strategies mitigation and adaptation.

Mitigation policies are those that seek to reduce the level of greenhouse gases in the atmosphere that contribute to climate change by either reducing emissions of methane and carbon dioxide or increasing “the net uptake of carbon dioxide through land-use change and forestry” (Jacoby et al., 2014). These policies are critical to preventing further damage to our planet and are advocated by scientists, scholars, and policymakers alike because anthropogenic climate change is primarily caused by increased levels of greenhouse gases in the atmosphere (Jacoby et al., 2014). Adaptation policies refer to actions that respond to, adapt to, and minimize the negative physical, social, and economic effects of climate change after they occur (Bierbaum et al., 2014).

Some common adaptation policies are zoning restrictions in coastal areas, ordinances to make buildings safer during storms, and funding research to create crops that can better withstand droughts (Bierbaum et al., 2014). Adaptation policies are important because of the uncertainty regarding the time, type, and intensity of the events that will occur due to climate change. As stated above, the dependent variable asks the respondent how they prefer to allocate money in mitigation or adaptation efforts. The survey states that the respondent is given \$100 that they may split between the two strategies. They can divide it anyway they wish, but it must add up to \$100.

The derivation of the dependent variable focused on the money they believe should be allocated to the policy of mitigation or to adaptation. Thus, we created a scale (see Figure 2) ranging from \$0 to \$100. Those who allocated \$20 to mitigation policies, for example, would be considered supporters of adaptation policies given that the remainder of the money, \$80 would be allocated to these types of policies.



**Figure 2 Distribution of Policy Preference from Adaptation to Mitigation**

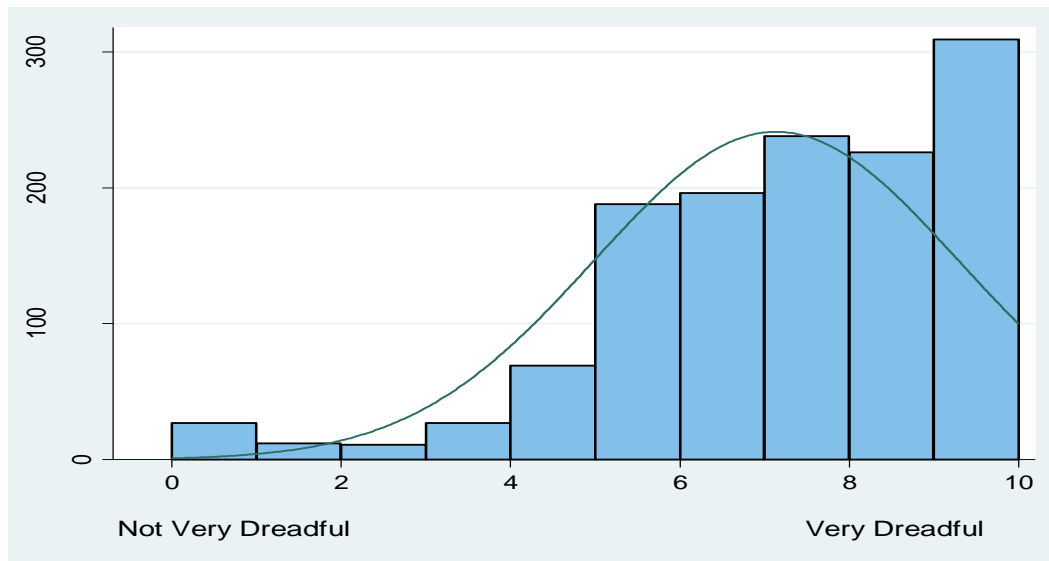
We argue that this is a better measure than simply asking people if they support mitigation policies, as it does not force them to place their preferences into only a few categories, like many surveys do. Instead, it allows those who would typically say “somewhat support” to use an actual value to demonstrate their support as the term “somewhat” can mean different things to different people. A simple question of “do you support mitigation policies” would not allow us to notice these subtle nuances. In Figure 3, we see that the modal category majority fell near the middle supporting both policies equally. There is, however, substantial variation along the spectrum for analytic purposes<sup>4</sup>.

Our key predictor variable assesses the decision-making framework. The first measures perceived knowledge. We ask the respondent, “How informed do you consider yourself to be about global warming and climate change?” It is measured on an 11-point scale ranging from 0 (not informed at all) to 10 (very well informed). The second measure is assessed knowledge. Assessed knowledge is computed as the mean of 10 true/false questions regarding climate change. We used both perceived and assessed knowledge measures to fully understand how the knowledge-based framework affects policy preferences.

The emotion/affect-based decision-making framework is measured using the following prompt: “Presuming that they actually occur, how would you rate the consequences of each of the following potential global warming and climate change threats in terms of how dreadful or terrible the consequences would be to the American people?” Fear and dread “serve as an early warning to indicate that some management action is in order” (Myers et al., 2012; Weber, 2006). Thus, the greater the fear individuals have about these events and the more dreadful they believe the consequences will be, the more likely they should support preventative climate change policies such as mitigation policies (Myers et al., 2012; Kane & Shogren, 2000).

Since these policies are proactive in nature, they will reduce citizens’ feelings of vulnerability as well as their fear and anxiety regarding the long and short-term effects of these events, such as damages to homes or food shortages (Kelly & Adger, 2000). This should result in these individuals being more supportive of mitigation policies.

It is measured on a scale ranging from 0 (not very dreadful or terrible) to 10 (highly dreadful or terrible) for each of the following potential outcomes caused by climate change: increased flooding, increased droughts, rising temperatures, increased wildfires, sea level rise, and stronger storms/hurricanes. It is calculated as an average feeling of dread by summing the answers to how much a respondent dreaded the events listed above and then dividing by the total number of events (see Figure 3).



**Figure 3**Distribution of Emotion/Affect Style

The correlations shown in the Table 2 demonstrate that the two decision-making frameworks are unique enough to be examined as separate styles. Particularly noteworthy is the low correlation between perceived and assessed knowledge. In order to test our two hypotheses, we used OLS regressions. In addition, we examined the variance inflation factor (VIF) in order to ensure that multicollinearity did not skew our results. Our models had an average VIF of 1.41 signaling that there is little or no concern about multicollinearity issues.

<b>Correlation Between Knowledge, Dread, and Policy Preference</b>			
	Policy Preference	Dread	Perceived Knowledge
1. Policy Preference			
2. Dread	0.41		
3. Perceived Knowledge	0.01	0.15	
4. Actual Knowledge	0.13	0.15	0.30

**Table 2: Correlation between Knowledge, Dread, and Policy Preference**

As noted, we include risk in the models. We control for risk given its relationship to policy preferences. Risk is measured as “How would you rate the level of risk posed to the American people by the following potential threats?” This is measured on a scale running from 0 (very low) to 10 (very high) and includes risk assessments for the threats of increased flooding, increased droughts, rising temperatures, increased wildfires, sea level rise, and stronger storms/hurricanes. Our risk measure is the mean of the aforementioned questions giving us an average overall risk level for each respondent. Because risk is so important to understanding climate change policy, we first illustrate in Model 1 of Table 3 what risk alone can explain. Then, we add it to the other models to see what decision frameworks can explain taking risk into account. We also control for the other variables that the climate change literature identify as important: party identification, party ideology, religious service attendance, member of an environmental group, age, education, race/ethnicity, gender, head of household, income, employment, marital status, and internet access (McCright et al., 2013).

The dispersion of these additional control variables is as follows: party identification is a 7 point scale that ranges from “Strong Democrat” to “Strong Republican”. Party ideology follows a similar left to right scale that ranges from 1=extremely liberal and 7=extremely conservative. Religious service attendance is measured on a 1-5 scale where 1=attend once a week minimum, 2=once or twice a month, 3=a few times per year, 4=once per year, and 5=never. Member of an environmental interest group is a dichotomous measure where 1=member of an environmental interest group and 0=otherwise. Educational attainment asks what is the highest level of education completed where 1=Elementary or some high school, 2=High school graduate/GED, 3=some college/Associate’s degree, 4=Bachelor’s degree, 5=Master’s degree and 6=Professional or Doctorate.

Race and ethnicity is a dichotomous variable where 1= white non-Hispanic and 0=otherwise. Employment is measured as 1=employed and 0=otherwise and marital status is 1=married and 0=otherwise. Finally, internet access is a dichotomous measure where 1=the respondent has access to the internet and 0=otherwise.

## 5. Findings

In order to separate out the effect of risk on decision-making frameworks we enter each of our main predictors in a stepwise manner. As seen across all models, risk significantly predicts policy preference. In Table 3, however, we see that while controlling for risk and Emotion/Affect decision style, knowledge is predictive of policy preference.

Tables 3 and 4 show that our first hypothesis is partially supported. Table 3 shows the truncated models that include only risk and our primary predictors. Table 4 shows the full models with all control variables. Individuals who reported higher levels of perceived knowledge regarding climate change are associated with less support for mitigation policies than those with lower levels of perceived knowledge. However, we find that higher levels of assessed knowledge show more support for mitigation policies. These results hold true when controlling for Risk and Emotional/Affect Style (see Table 3). The relationship between assessed knowledge and policy preference decreases when all control variables are introduced into the model (see Model 5b).

**Table 3: Decision Style and Support for Climate Change Policy (Truncated Models)**

<b>Decision Style and Support for Climate Change Policy (Truncated Models)</b>				
	Model 1	Model 2	Model 3	Model 4
Risk	3.018*** (0.246)	1.589*** (0.327)	1.656*** (0.329)	1.676*** (0.327)
Emotion/Affect Style		2.597*** (0.397)	2.445*** (0.397)	2.527*** (0.396)
Perceived Knowledge		-0.797** (0.268)		-0.998*** (0.276)
Assessed Knowledge			0.771* (0.384)	1.135** (0.396)
Constant	36.187*** (1.700)	31.182*** (2.567)	23.040*** (3.058)	25.931*** (3.146)
R-squared	0.109	0.141	0.138	0.147

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, N=1,234

**Table 4: Decision Style and Support for Climate Change Policy (Expanded Models)**  
**Decision Style and Support for Climate Change Policy (Expanded Models)**

	Model 3	Model 4	Model 5a	Model 5b
Risk	2.561*** (0.262)	1.422*** (0.341)	1.451*** (0.340)	1.447*** (0.341)
Emotion/Affect Style		2.079*** (0.408)	2.146*** (0.408)	2.045*** (0.408)
Perceived Knowledge			-0.828** (0.282)	
Assessed Knowledge				0.651 (0.405)
Party Affiliation	1.221** (0.375)	1.114** (0.372)	1.103** (0.370)	1.140** (0.372)
Political Ideology	-1.926*** (0.506)	-1.818*** (0.501)	-1.819*** (0.500)	-1.779*** (0.501)
Religious Participation	-0.307 (0.421)	-0.401 (0.417)	-0.446 (0.416)	-0.427 (0.417)
Environmental Interest Group	-8.566* (3.356)	-7.739* (3.325)	-6.398+ (3.346)	-7.857* (3.324)
Age	0.017 (0.044)	0.005 (0.044)	0.013 (0.044)	-0.004 (0.044)
White Non-Hispanic	2.762+ (1.602)	2.808+ (1.589)	2.783+ (1.583)	2.554 (1.595)
Female	1.574 (1.276)	1.515 (1.264)	0.780 (1.285)	1.676 (1.267)
Head of Household	1.239 (1.758)	1.252 (1.741)	1.415 (1.737)	1.289 (1.740)
Household Income	0.372 (0.231)	0.278 (0.230)	0.387+ (0.232)	0.213 (0.233)
Employment Status	-0.259 (1.383)	-0.044 (1.370)	-0.203 (1.367)	-0.198 (1.372)
Internet Access	0.851 (1.766)	0.108 (1.756)	0.221 (1.750)	-0.126 (1.761)
Marital Status	1.578 (1.447)	1.707 (1.433)	1.442 (1.432)	1.865 (1.436)
Constant	34.703*** (5.102)	28.922*** (5.207)	32.353*** (5.321)	26.286*** (5.456)
R-squared	0.148	0.163	0.170	0.165

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.10

N=1,200

While more research is warranted, we have considered some viable explanations for these results. It is possible that those using the perceived knowledge framework see fewer benefits associated with mitigating policies and see adaptation policies as more politically and economically feasible (Kane & Shogren, 2000). It is also possible that those with higher levels of perceived knowledge understand the uncertainty regarding some of these threats, such as when they will occur and how intense they may be, and consequently prefer “wait and see” types of policies (Weber & Stern, 2011).

We find that our second hypothesis is also supported. Across all models, individuals scoring higher on the emotion/affect based-decision making framework tend to be more supportive of mitigation policies than those scoring lower. The more fear/anxiety/dread individuals felt, the more supportive they are of mitigation climate change policies. This finding supports our theory that those using the emotion/affect-based decision-making style are more likely to support inherently proactive policies than reactive adaptation policies. The significance of this result holds across all models and different control variables.



One possible explanation for this may be that these types of preventative policies work to ease the fear and anxiety that individuals have regarding climate change and the events associated with it (Myers et al., 2012; Erhlich & Becker, 1972). Thus, those using this style can reduce their feelings of dread by supporting policies that seek to stop the threats associated with climate change from occurring. Supporting these types of policies would then allow individuals to focus their attention and energies on other areas instead of worrying about the threats that climate change poses. After examining these results, those using the emotion/affect-based decision-making framework are more supportive of mitigation policies than those using the knowledge-based decision style are. This relationship is statistically significant (see Tables 3 and 4) even when we control for risk.

This suggests that the decision-making framework itself can affect one's policy preferences. That these two styles result in support for two different types of policies shows that the role decision styles play in policy preferences is possibly more dramatic than we originally hypothesized. Although extant literature may show some intermittent relationships, we find very little association between sociodemographic characteristics and policy preference when our main predictors are included in the analysis.

## 6. Discussion

Based on our findings, it is possible that by knowing an individual's decision-making framework, or schema, scholars and policymakers may be able to better predict one's climate change policy preferences<sup>5</sup>. We find that decision frameworks are an important factor that should be included in models trying to determine one's climate change preferences for mitigation and adaptation policies. One may wonder why the knowledge-based decision style (perceived knowledge specifically) results in less support for mitigation policies while the emotion/affect-based decision style relates to increased support for mitigation policies. One potential explanation is that those using the knowledge-based decision style have acquired a vast amount of facts regarding climate change, and therefore, they are more aware of the political discussions surrounding the issue as portrayed in the media. Some may feel that there are benefits that can come from climate change, such as milder winters and therefore longer growing seasons. As a result, they adopt a "wait and see" attitude rather than a "prevent all changes" mindset.

It may also be plausible that they understand that the earth's climate naturally has change cycles that are beyond the control of humans (Cook et al., 2013). Supporting policies that only seek to prevent climate change, therefore, may not seem the best possible approach given that some changes are going to happen regardless. Thus, support for reactive policies, such as adaptation, may make more sense to individuals using the knowledge-based decision framework, as they will help people be prepared for whatever environmental changes, whether natural or anthropogenic, that may occur (Cook et al., 2013). As climate change has become increasingly politicized, one's assessed knowledge levels may not accurately reflect scientific facts. As such, the lack of significance from the assessed knowledge is not surprising given that we control for political ideology and party affiliation.

Those who use the emotion/affect-based framework, however, may simply want to prevent the events from occurring because of the negative emotions they feel towards these threats (Myers et al., 2012). Therefore, they may prefer mitigation policies to adaptation since they address their fear/anxiety towards climate change threats instead of letting these feelings fester as they wait for the events to occur and then respond. The fact that each corresponds to support for a different policy also stresses the importance of knowing the decision framework that individuals use. While previous literature has demonstrated the importance of one's risk assessment in determining policy preferences, we find that the decision style itself also plays an influential role. This suggests policymakers and scholars may still be able to predict one's climate change policy preferences even if they do not know how an individual has assessed the risk involved. It is also plausible that they may be able to better predict preferences by including decision styles into the calculations along with other, more traditional factors, such as risk, gender, party identification, and political ideology.

These findings may also be beneficial in understanding why some people choose to support a particular policy despite changes in facts regarding climate change or shifts in national trends of attitudes towards climate change. For example, one may continue to support mitigation policies despite the publication of new facts regarding the potential benefits of climate change for some areas and people, due to the use of the emotion/affect-based decision-making framework. Thus, our analysis further suggests that decision style as well as risk assessment, party identification, and political ideology should be taken into consideration when one seeks to understand how individuals arrive at certain policy preferences.

## 7. Conclusion

Several factors are traditionally associated with one's climate change policy preferences. We find that in addition to the usual suspects such as risk assessment, party identification, and political ideology, decision-making frameworks also have a statistically significant effect on one's support for policies that set out to address climate change issues. In some cases, these effects are larger than the effects of the more traditional variables. This suggests that while traditional measures are important in determining citizens' climate change policy preferences, not including a variable accounting for one's decision-making framework can result in an underspecified model that may not accurately predict policy preferences.

This could be potentially misleading and result in inefficient and ineffective public policy. Thus, the inclusion of decision frameworks may help policymakers better determine who will be supportive of certain policies. This is especially true given the stark differences in policy preferences between those who rely on one dominant decision framework, even when controlling for risk and other demographic factors. A person using a particular framework may support policies that are counterintuitive to their political ideology or education level, so long as it corresponds to their dominant decision framework. Thus, knowing which framework corresponds to a person, or identifying if certain populations prefer specific frameworks may help scholars and policymakers account for the "known unknowns" that often affect policy decisions (Manski, 2013).

Furthermore, this paper introduces a number of potential research avenues. To illustrate, it may be important to determine how often people change decision-making frameworks and what factors may motivate these changes. Likewise, it may be beneficial to extend the examination of decision frameworks to other policy areas, such as healthcare, welfare, and education, to see if the findings in climate change transfer to other policy domains. Thus, while our initial analysis shed some light on the effects of decision-making frameworks, we encourage scholars to engage in more extensive examinations of these frameworks in order to improve our understanding of citizens' policy preferences.

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<sup>1</sup>As defined "in the context of climate change [risk] is the perceived insecurity arising from realized (experienced) or anticipated (perceived) impacts associated with changing extreme weather events, and often immediate threats to life and livelihood, which are of greatest concern to individuals or, collectively, to society" (Dessai *et al.* 2004:14). This definition of risk is "based on psychological, social, moral, institutional and cultural processes that influence perceptions of individuals and societies about what constitutes danger and significant impact".

<sup>2</sup>Since study sample sizes are typically too small to accommodate a complete cross-tabulation of all the survey variables with the benchmark variables, a raking procedure is used for the post-stratification weighting adjustment. Using the base weight as the starting weight, this procedure adjusts the sample data back to the selected benchmark proportions. Through an iterative convergence process, the weighted sample data are optimally fitted to the marginal distributions. After this final post-stratification adjustment, the distribution of the calculated weights are examined to identify and, if necessary, trim outliers at the extreme upper and lower tails of the weight distribution. The post-stratified and trimmed weights are then scaled to the sum of the total sample size of all eligible respondents.

<sup>3</sup>While we focus on mitigation and adaptation policies, we are not treating these policies as polar opposites. We use these two categories because they are found in the literature as well as in the media as a way to group the wide range of policy options available. We follow previous and current literature by using these two categories to frame climate change policies when surveying citizens. Furthermore, mitigation and adaptation are official categories used by scientists and government agencies when grouping individual climate change policies.

<sup>4</sup>The purpose of our single sliding allocation scale between mitigation and adaptation is NOT to identify an absolute position on money allocation to this issue, but rather to force a choice between the two major policy action response categories. It is intended to measure the relative positions of mitigation and adaptation in the public's mind now and could inform future policy discussions should events require some governmental response at some future time.

<sup>5</sup>We acknowledge that there are limitations to our survey. There are many factors that cannot be captured in our survey because they may be immeasurable—the fact that people may be asked questions that they have not thought about in the past, no responses, or that they may require the use of personal identifiers. These, along with a host of other factors, are common limitations of survey research (Fowler 2008). However, we believe that our survey was designed to collect data in a reliable and accurate manner.

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