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Cognitive Processing and Climate Change: the Impact of Political Ideology on Processing Climate Change Information

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COGNITIVE PROCESSING AND CLIMATE CHANGE: THE IMPACT OF POLITICAL IDEOLOGY ON PROCESSING CLIMATE CHANGE INFORMATION

A Thesis in Communication

by

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Abstract

This study addressed information processing for climate change messages from representatives of a political party. The purpose of this study was to determine the relationship between the political ideology of a message source and message sender and its impact on perceived hazard characteristics, negative affective response, and information processing behavior. Hypothesis 1 and Hypothesis 2 posited that when the source and message receiver have the same political ideology, the receiver will experience heightened levels of concern about climate change. Hypothesis 3 and Hypothesis 4 posited that, regardless of the message source, participants are more inclined to heuristically process information. Research Question 1 sought to determine the circumstances which resulted in the highest levels of perceived hazard and negative affective response. Participants included US citizens of legal voting age with no barriers for geography, age, or race. Participants were asked to read a statement that randomly varied in source treatment then complete a survey. Results revealed that the source treatment for climate change messages had an impact perceived hazard and affective response with implications that issue salience and expectations violations could have an effect on how individuals respond to climate change messages.

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Introduction

The phrase “climate change” describes a scientific phenomenon as well as a hotly-contested public policy issue. The scientific axiom of climate change refers to gradual changes in global temperature which occur over thousands of years but have been recently expedited due to human activity. The public policy issue of climate change refers to governmental interventions aimed at mitigating the effects of climate change, limiting environmental degradation, and slowing the processing of global temperature change. Climate science, which has influenced both the political and scientific understanding of global climate, began as early as the 1800s. Scientists initially determined that planet Earth is predisposed to natural climate changes as seen during multiple global ice ages (Hulme, 2009). In 1824, French physicist Jean-Baptiste Joseph Fourier began uncovering details of the greenhouse effect (Hulme, 2009). In the 1890s, studies conducted by Svante Arrhenius determined that atmospheric carbon dioxide levels that accumulated over time could impact global temperatures. Arrhenius predicted that it would take centuries to see global temperature change based on accumulation of human-produced CO2, making anthropogenic climate change an unfathomable concept at the time.

As time progressed, human activity and greenhouse gas emissions played an increasingly prominent role in climate change research. The 1960s marked the beginning of the “environmental awakening,” during which the human impact on environmental health first became a topic of public interest (Hulme, 2009) as opposed to a topic addressed almost exclusively in the scientific community. In 1962, Rachel Carson initiated the awakening by publishing her provocative book, *Silent Spring*. Just a decade later, in 1972, the United Nations hosted the first international conference on environmental issues in Stockholm, Sweden. These events marked an important shift—climate change had expanded from the scientific realm and

into the realm of politics, culture, and mass media. Politicians and news media became an environmental information resource for the American public, responsible for translating the complex science of climate change to the masses.

Literature Review

The Climate Change Debate. In the United States, there initially appeared to be political consensus regarding environmental action and mitigation policy. In 1987, Republican President Ronald Reagan and a Democratic Congress signed the first international treaty with CO_2 reduction goals (Hulme, 2009). Subsequently, Reagan's Vice President, President George H. W. Bush, won the Presidency in 1989 and pledged to require consideration of environmental impacts in all policy development and to support the creation of the United Nations Intergovernmental Panel on Climate Change (IPCC). At one point, he even referred to himself as the "environmental president" (Worland, 2017). Such actions made it seem as though environmental protection would be a bipartisan priority.

However, this political consensus on the importance of legislative environmental protections deteriorated, in large part due to corporate interest groups. Numerous American corporations saw carbon emissions restrictions as a business and operational risk and questioned the necessity of curbing emissions (Johnson, 2012). Studies funded by these corporations challenged scientific findings on the causes and impacts of climate change and positioned climate change mitigation as a threat to national economic growth (Worland, 2017). These studies now serve as the foundation for climate skeptics and are promoted to a higher degree by those who identify as politically conservative. On the contrary, research efforts from the political left, or liberal ideology, have aimed to highlight the peril of neglecting and abusing the natural environment. Today, these two contrasting research foci and findings have created a political and

social rift between as those who are concerned about climate change (liberal ideology) and those who are skeptical about its existence or causes (conservative ideology).

Aside from conflicting research findings, a non-scientific factor exacerbating the climate change debate is the power of political action committees (PACs) and super PACs. Political action committees use funding and financial donations to influence elections, endorse candidates, and impact legislation (Paliewicz & McHendry Jr., 2017). A study published in the Harvard Business Review revealed that companies with the highest and lowest levels of greenhouse gas emissions spent the most on climate change lobbying (Delmas, 2016). This indicates that organizations on both sides of the climate change debate are actively lobbying political actors to influence the direction of climate change policy. By funding and lobbying politicians, PACs perpetuate the climate change debate and disrupt environmental legislation by pushing divisive policy agendas.

However, interest group and PAC activity often occur outside of the public eye, so the polarization of public opinion on climate change is the result of information disseminated via other, more public routes such as news media and the politicians on the receiving end of interest group lobbying and political contributions. The Pew Research Center reveals that only 15% of Conservative Republicans believe the Earth is warming due to human activity, as compared to 79% of Liberal Democrats (Funk & Kennedy, 2016). These findings indicate that public opinion on climate change is more divided than opinions within the scientific community, suggesting that public opinion is not a direct byproduct of scientific research. This study will consider the role of political rhetoric and political identity and attitudes in forming public opinion on climate change.

Political Identity and Political Attitudes. Political identity is an integral part of a person's social identity and functions as a cognitive assistant for attitude formation, decision making, and

information processing. Social identity alone is defined as an individual's sense of self, derived from inclusion in a social group (Landa & Duell, 2015). Political identity refers more specifically to an individual's sense of self based on his or her political values and behaviors. The two identities are deeply intertwined in that political identity is a subset of one's social identity. For example, social groups such as political parties or politically-based organizations are manifestations of the political and social identity. Furthermore, people use their actions, such as involvement in politically-based social groups, to psychologically reinforce their perceived social and political identities (Akerlof & Kranton, 2010). Voting behavior and policy opinion are directly tied to political identity, which becomes an aspect of social identity. Put another way, political affiliation impacts how people act and view themselves and how they reaffirm their identity. Given the importance of political identity, it is important to understand how it is formed and reaffirmed. This paper will reflect on the role of social interactions and political actors in the formation political identity and policy opinions.

Social interactions are instrumental in shaping and reaffirming political beliefs. People are drawn to others they perceive to be likeminded and form homogenous groups based on value similarity (Landa & Duell, 2015). There is a reciprocal relationship between political ideology and politically charged social interactions, meaning that social interactions help people shape their political ideology but are also reinforce existing political ideologies (Cho, 2005). Therefore, within likeminded groups, people experience validation of their existing political identity while sharing and expanding their political ideology through interactions with others. People are also prone to in-group bias, which occurs when individuals favor members of their shared social group or experience reservations about out-group members (Chen & Li, 2009; Taber & Lodge, 2006). Politically, in-group bias allows people to maintain their political identity by seeking

information from like-minded sources while avoiding or discounting information from those who do not share the same political identity. In extreme cases, individuals may choose to support political in-group ideals at the expense of relevant information (Cohen 2003; Rahn, 1993) or engage in partisan motivated reasoning to reinforce their political identity by countering opposing information (Mullinix, 2016). The issue of climate change, which has become highly politicized, is particularly susceptible to partisan-based attitude formation.

Political actors (or sources) also influence political identity formation. The opinions of political elites, or politicians, have significant persuasive impact. Mullinix (2016), focusing on voter activity, found that partisans are more likely to support a policy that is publicly supported by their party elites and are more likely to take the same issue position as their party elites. This type of decision-making is also a product of partisan motivated reasoning (Bolsen, Druckman, & Cook, 2014; Lavine & Renn, 2012; Slothus & de Vreese, 2010). Individuals use political parties as a means of validating their political identity through others. Identifying with and drawing on the expertise of political party elites helps people form stable and coherent opinions and attitudes to confirm their political identity (Disch, 2010; Levendusky, 2010).

Research has found that the pull of political elites is enough to influence whether a voter accepts or rejects information simply because they have the same basic political ideology as the message sender. This phenomenon is best exemplified by Krosnick et al.'s (2000) study of the public reaction to then-President Bill Clinton's endorsement of the Kyoto Protocol, a multinational agreement to cut carbon emissions. The study found that his endorsement of the Protocol increased issue polarization between Democrats and Republicans, or liberals and conservatives. Based on their status as part of a different political group than then-President Clinton, conservatives determined that pro-environmental policy was not one of their social

norms and chose not to support the Kyoto Protocol. Liberals, who shared values with Clinton, supported the Protocol and its underlying principles. These political reactions and attitude formations were almost entirely the result of ideological similarity (or dissimilarity) between constituents and a political leader.

It is important to note that political ideology does not happen in a vacuum. Research has revealed that the influence of partisanship declines when a policy impacts an individual's daily life or when personal involvement is otherwise high (Mullinix, 2016). Political ideology is a construct based on personal values and worldviews. Typically, people are motivated to find others with similar values and they form social groups such as political parties. However, party ideals may not always perfectly align with an individual's political ideology, which means it is import to differentiate between political ideology and political party affiliation. Political ideology ranges from liberal to conservative, whereas political party identities range from Democrat, based on liberal ideology, to Republican, based on conservative ideology. For the purposes of this research, the focus will be on political ideology, rather than political party affiliation, and its influence on how environmental information is processed. While research suggests that people are more inclined to disregard their political ideology or affiliation when issues impact their daily life, this has not been the case for climate change politics. Climate change remains polarized along party lines, as indicated by legislative divisions and public opinion polls, despite the fact that climate change activity has begun to impact daily life in some regions of the world. Therefore, it becomes increasingly important to understand how political ideology remains an indicator of the way people process climate change information.

Information Seeking and Processing. Human behavior and decision making are impacted by external cues (political actors and group membership), as well as cognitive shortcuts (political

affiliation), as opposed to in-depth information processing or high cognitive effort. Thus it is essential to understand how individuals process information when dealing with risk, including what factors impact this process and its outcomes. The Risk Information Seeking and Processing Model (RISP) provides a framework for understanding the direct and indirect factors influencing information seeking and processing behavior with respect to risk information (Griffin, Dunwoody, & Neuwirth, 1999). RISP is typically applied to health risk information or, as is the case with this study, environmental risk information. The basic tenant of the RISP model is that an individual's characteristics will determine how they process risk information, such as climate change information, and that how they process information will determine how stable or volatile their attitudes and behaviors are over time (Griffin et al., 1999). The model uses seven factors to determine probable seeking and processing behavior: individual characteristics, perceived hazard characteristics, affective responses to the risk, informational subjective norms, information sufficiency, perceived information gathering capacity, and relevant channel beliefs. While all factors have a significant impact on processing, the factors under consideration in this study are: individual characteristics, perceived hazard characteristics, affective response, and informational subjective norms. This factor specifically contributes to determining the impact of a person's political identity on his or her affective and cognitive reactions to messages about environmental mitigation policy.

Individual Characteristics. The individual characteristics considered by RISP include relevant hazard experience, political philosophy, and demographic or sociocultural attributes. These characteristics provide an overarching influence on all the other factors in the model. This study will focus on the role of political philosophy, or political ideology, in predicting seeking and processing behavior. This facet of the model has not been broadly considered, and there is a

lack of research on how political ideology influences other factors within the model. Griffin, Dunwoody, and Neuwirth's (1999) first discussion of the importance of political philosophy is as follows:

> Liberalism-conservatism could affect acceptance of hazard reduction regulations (Gould et al., 1988) and, more generally, trust in risk management institutions. (p. S234)

This explanation specifically focuses on institutional trust, which is just one component of a person's political ideology and identity. Few RISP studies have considered the influence of political ideology on model outcomes (Yang et al., 2014; Hwang & Jeong, 2016; Kahlor et al., 2006). However, the importance of political identity has been confirmed in research conducted outside of the RISP model, demonstrating political ideology's impact on attitude formation, processing behavior, and voting behavior (Landa & Duell, 2015; Disch, 2010; Levendusky, 2010; Bolsen et al., 2014; Lavine et al., 2012; Slothus & de Vreese, 2010; Srull & Nyer, 1979; Mullinix, 2016). Overall, research points to political philosophy as more than a sense of trust in institutions and its expanded influence within the model will be explored at length.

These studies collectively indicate that political ideology influences information seeking and processing through its direct influence on perceived channel beliefs, affective response, and informational subjective norms. The reciprocal relationship between political ideology and social interactions, through which ideology influences cognitions about the self and others, indicates the influence of political ideology on subjective norms (Cho, 2005). A person's sense of belonging in a political group or in categories (liberal or conservative) help him or her to form stable opinions and attitudes and make sense of the world (Mullinix, 2016). In the case of the RISP model alone, political philosophy can be considered a determinant of perceived hazard characteristics, affective responses, and informational subjective norms.

Perceived Hazard Characteristics. The perceived hazard characteristics factor is often divided into categories, but these can vary slightly depending on the researcher (Griffin et al., 2008). For the purposes of this study, the following categories will be used: risk perceptions, perceived personal control (self-efficacy), and institutional trust. These categories are used to determine the salience of a risk and impact levels of perceived information insufficiency and affective responses to risk (Griffin et al., 2008; Griffin, Neuwirth, Dunwoody, & Giese, 2004; Griffin et al, 2014; Yang et al., 2014). As indicated by the initial RISP study, institutional trust and political ideology have an important relationship (Griffin et al, 1999) so institutional trust will be especially important to consider.

Lack of institutional trust moderates risk communication effectiveness (Slovic, 1999) which prompts communication scholars to seek a better understanding of the topic. Institutional trust is defined as a person's willingness to follow the recommendations of those responsible for decision making or action (Siegrist, Cuetkovich, & Roth, 2000). Often institutional trust is applied to matters of public health, environment, safety, and technology; however, this research will focus specifically on trust in political bodies for environmental risk. Liberal or conservative political ideologies impact the acceptance of mitigation policies related to environmental risk (Gould, 1988) and overall trust in specific institutions managing risk may be influenced by political ideology (Griffin et al., 1999). For example, trust in an institution may be derived from political similarity between the institution and the message receiver. If a person feels that an organization or institution is effectively representing them and their political agenda, they would be more inclined to adopt the hazard characteristics of the institution. Simply put, if a person considers an institution to be credible then they will consider issues that are important to the institution to be important in their own lives.

Political elites also play a large role in guiding the attitudes and behaviors of information processors, especially for politicized issues such as climate change. Malka and Krosnick (2009) describe the role of political identity in how climate change information is processed;

> "As political ideology plays a large role in people's beliefs about climate change and their policy support, problems with public understanding are not mainly due to a knowledge deficit but often result from a deficit in trust in the conveyors of climate models and data." (Weber & Stern, 2011, pg. 323).

Malka and Krosnick (2009) identify one of the major problems with environmental communication, a lack of trust between message receivers and message sources. In cases where people are skeptical of climate change science, the level of perceived risk from not taking action against climate change is very low and skeptics do not feel a serious threat.

Brewer and Ley (2013) have determined that trust and credibility are vital aspects in communication efforts which seek to influence audiences and establish distinct attitudes towards an issue. In other words, source credibility and source similarity are important social resources for determining who holds political or social power (Renn & Levine, 1991) and how people perceive risk. This has resulted in climate change and mitigation policy becoming matters of personal beliefs in the U.S. (Gauchat, 2011). Therefore, an individual's political ideology or sense of political similarity with message senders play a role in determining which sources he or she finds trustworthy, how he or she processes information from certain sources, and if he or she perceives something as a hazard or threat.

Another problem with climate change risk information is that it is not usually associated with personal risk. As an impersonal risk, issues of environmental degradation and climate change do not pose an immediate personal threat. Personal threats heavily impact risk perceptions and

increase the likelihood of perceived risk. This fact, in conjunction with possible institutional distrust, often prevents engagement with environmental information (Lorenzoni, Nicholson-Cole & Whitmarsh, 2007). For example, people are generally more concerned with financial risks that affect their day-to-day lives than environmental risks that impact the ecological balance of their regions or countries.

High levels of perceived hazard are more likely to result in information processing. Perceived hazard characteristics, such as perceived susceptibility and perceived severity of risk, impact an individual's affective response to information (Griffin et al., 2004). The lack of salience of environmental risk (low perceived hazard characteristics), can pose a barrier to seeking and systematically processing environmental risk information.

Affective Response. Perceived hazard characteristics impact affective responses to risk. Greater perceptions of risk lead to more extreme affective responses (Yang et al., 2014). Since risks are defined as a threat to a person or his/her values, typical affective responses to environmental risk information are negative, including fear, worry, anger, and guilt. However, messages designed to induce negative affect have been met with mixed reviews (Yang et al., 2014; Maibach, Roser-Renouf, and Leiserowitz, 2008; Nabi, 2015).

Negative affective responses to environmental risk information may lead to feelings of fatalism, which leads to disengagement, information avoidance, and a reduced likelihood of systematic processing (O'Neill & Nicholson-Cole, 2009). Maibach, Roser-Renouf, and Leiserowitz (2008) propose that messages of self-efficacy would help diminish the effects of fatalistic feelings or disengagement by making people feel that they possess the ability to reduce a risk. Nabi (2015) expanded on this idea by proposing the *emotional flow* of affective responses in which message senders use negative affect, to increase cognitive attentiveness but causing a

person to feel worry, sadness, or anger because of a message. This is then followed by messages of self-efficacy to induce feelings of hope, alleviating the negative affective response.

Overall, research has established that messages designed to trigger a negative affective response can increase cognitive activity and, therefore, increase the likelihood of information seeking and processing (Yang et al., 2014). Fischer and Glenk's (2011) study makes an important discovery—that systematic processing is often used to re-confirm existing values and beliefs but will not necessarily prompt pro-environmental protection attitudes or behaviors. Meanwhile, Yang et al. (2014) argue that support for climate mitigation may be achieved through the use of both affective and cognitive paths, meaning that emotional responses and congruent pro-environment ideology could work together to increase processing behavior. These considerations reinforce the idea that existing political ideology will determine an affective response to environmental risk information and, together, the two will influence how a person processes risk information.

Informational Subjective Norms. Social norms are broadly defined as perceptions about which behaviors are acceptable or common within a group (Cialdini & Trost, 1998). In the RISP model, social norms are applied to circumstances of risk, creating informational subjective norms—the perceived social pressure to be informed about a risk. The influence of informational subjective norms on environmental risk has also been confirmed in psychology research. For example, normative messaging about pro-environmental behavior significantly promotes energy conserving behavior and mitigation policy support (Goldstein, Cialdini, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007; Jerreau et al., 2017) as well as increased investment in ecosystem protection programs (Chen, Lupi, He, & Liu, 2009).

Informational subjective norms influence the processing behavior of information receivers as well as their attitudes and behaviors towards environmental risk information.

In responding to surveys, people often indicate that they would not be influenced by the actions of those around them (Nolan et al., 2008). Nevertheless, studies have shown that subjective norms, community behaviors, and cultural values do influence people's actions (Corner, Markowitz, & Pidgeon, 2014; De Groot & Steg, 2008; Steg & de Groot, 2012; Jarreau, Altinay, & Reynolds, 2017; Sleeth-Keppler, Parkowitz, & Speiser, 2017). Similarly, research confirms that people trust those with whom they share similar values and intentions (Earle & Siegrist, 2006; Earle, Seigrist, & Gutscher, 2010). Sleeth-Keppler et al. (2017) contributed to this discussion by confirming that subjective norms are formed based on a person's social groups and that communal influence is a key in forming attitudes toward mitigation policy. People may think that they are independent decision makers, but they clearly tend to embrace the behaviors and attitudes of their community and social groups.

Subjective norms can transform social norms into personal norms (ter Huurne et al., 2006), meaning that people may adopt personal norms based on the behaviors and attitudes of those around them. An individual's social surroundings can also affect one's desire to seek information. Particularly, individuals are more likely to seek information on a topic about which their peers are well-informed (Radecki & Jaccard, 1995). The impact an individual's surroundings and social network have on their information seeking becomes increasingly important as the average American learns about climate change via secondary sources such as political elites. The science of environmental risk contains complex elements those who do not study natural sciences do not easily understand. Thus, environmental information often needs to be simplified by a secondary source (Weber & Stern, 2011). A lack of scientific knowledge

increases the influence of subjective norms on behavioral change by allowing social influencers and secondary sources to serve as environmental risk information sources (Slovic, 1987).

Political leaders are a common mediated source of information for people without extensive scientific knowledge (Tranter, 2013; Paolino, 2017). Therefore, secondary sources such as political leaders become responsible for educating the public about complex topics such as climate change. Referring to political ideology findings, if political leaders are a prominent source of climate change information, then people will likely seek politicians with similar opinions as their own in an effort to reinforce existing ideologies (Coleman, 1957; Hallinan, 1974; Lazarsfeld & Merton, 1954). Goren's (2005) research establishing that party identification is circumstantially more stable than abstract beliefs and the knowledge that people are inclined to process information heuristically (Eagly & Chaiken, 1993) indicates that political identity and social leadership can impact perceptions of climate change over fact-based information sources. More convincingly, message processors are more likely to take cues from political leaders rather than substantively assessing the evidence or arguments associated with non-issue important topics (Gilens & Murakawa, 2002).

Therefore, we can establish that political ideology provides message receivers with a heuristic cue for processing information. Their party identity becomes a lens through which they view issues. Policy opinions are developed based on party objectives and cues from political elites (Tranter, 2013). Essentially, once a person establishes a political ideology they also develop a group of likeminded people and information sources who reinforce that ideology and form politicized subjective norms.

Though the strength of an individual's opinion towards a specific policy may temper partisanship, party identification and ideological values have been found to strongly impact

attitude formation, political behavior, opinions of public officials, and information processing (Feldman, 1988; Alvarez & Brehm, 2002; Paolino, 2017). The foundation of party identification is in the social perceptions of the associated political ideology and the subsequent emotional attachment individuals have for that identity (Campbell et al., 1960). The social closeness one feels for his/her political party creates an affective attachment to one's political ideology (Campbell et al., 1960) which forms a strong, stable lens through which people view society and policy and plays a prominent role in issue attitude formation.

Acknowledging that political ideology is a source of attitude formation and social connection, it is unsurprising to see that political leaders serve as an information intermediary between the scientific community and their constituents. Krosnick, Holbrook, and Visser (2000) conducted a study confirming that attitudes towards polarized political issues are often a product of the message sender's credibility. In fact, communicators may be deemed untrustworthy if they possess a single characteristic that starkly opposes the characteristics of a message receiver, and any communicated messages may be rejected (Kruglanski & Sleeth-Keppler, 2007). In the case of environmental policy, this implies that political ideology and social cues from political elites will impact processing and can drive people to make policy decisions based on political ideology or affiliation.

The following hypotheses were developed based on the existing research and its implications for the relationships between political ideology, subjective norms, perceived hazard characteristics, and affective responses:

> H1: Individuals with a liberal political ideology will indicate higher levels of perceived hazard and negative affect when receiving messages that emphasize concerns about climate change coming from a liberal political source versus a conservative source.

H2: Individuals with a conservative political ideology will indicate higher levels of perceived hazard and negative affect when receiving messages that emphasize concerns about climate change coming from a conservative political source versus a liberal source.

RQ1: What combination of political ideology and political source displays the highest level of perceived hazard and negative affective response following a message that emphasizes concern about climate change?

RISP Model Outcomes. The RISP model explains how people obtain and process information. First, in evaluating how people obtain information, the model has a range from high to low information seeking. Second, in evaluating how people process information, the model ranges from systematic processing to heuristic processing. Third, the model also acknowledges that some people avoid information completely. Thus, the five potential model outcomes are as follows:

1. High information seeking and systematic processing
2. High information seeking and heuristic processing
3. Low information seeking and systematic processing
4. Low information seeking and heuristic processing.
5. Information avoidance

The highest level of involvement includes non-routine information seeking and systematic processing which is characterized by information seeking beyond the mainstream information outlets and high levels of cognitive processing effort. Low involvement is characterized by routine seeking and heuristic processing—when individuals get information from standard sources, such as the nightly news, and use heuristics cues, such as source credibility, to develop

attitudes about the topic (Chaiken, 1980; Eagly & Chicken, 1993). All five processing outcomes can occur with varying intensities based on the person's level of involvement with the risk.

Information avoidance occurs when message receivers opt out of seeking or processing activity. In general, individuals engage in avoidance when they perceive that information will cause psychological discomfort (Kahlor et al., 2006) or they feel satisfied with their knowledge of an issue.

As discussed above, the model outcomes on obtaining information range from routine seeking to non-routine seeking (Griffin et al., 1999). An individual engaged in non-routine seeking is motivated to obtain information from non-routine sources, usually to achieve a goal, self-expression, reduced cognitive tension, or autonomy (McGuire, 1974). When highly motivated, people may reach out to experts or do online or library research. In contrast, an individual engaged in routine seeking is obtains information from more routine sources, such as newspapers or televised daily news reports. These individuals generally seek to maintain their current identity. Information *seeking* behavior, including information avoidance, explains how people obtain information; in contrast, information *processing* behavior explains how people *interact* with the information.

The two model outcomes on the processing scale are systematic processing and heuristic processing. Systematic processing is characterized by high cognitive effort. When individuals systematically process information, they look beyond easily accessible information to develop their own, first-hand understanding of the risk in question. Systematic processing is often the result of high issue involvement. Conversely, heuristic processing is a product of low issue involvement (Chaiken, 1980).

The proximity of a threat impacts involvement and therefore impacts processing behavior. As was established, climate change actively impacts people's lives, which suggests that people should use systematic processing in evaluating climate change information. However, research indicates that heuristic processing is often selected over systematic processing. Heuristic processing relies on easily accessible information, social cues, cognitive shortcuts, and non-content clues such as a message sender's appearance, tone of voice, or reputation. Research has also determined that heuristics, or cognitive shortcuts and social cues, are employed when an individual wishes to avoid contradicting information (Giner-Sorolla and Chaiken, 1997) or determines that in-depth processing is not necessary (Chaiken and Maheswaran, 1994; Moskowitz and Chaiken, 2001). People uses heuristics regularly to lighten the cognitive load in a world in which we are increasingly inundated by new information.

Further complicating this issue are situations in which individuals wish to induce behavior/attitude change in others. Systematic processing has been found to lead to longer lasting attitudes and is more closely linked with behavioral intent (Chaiken 1980; Petty and Cacioppo, 1986; Griffin, Dunwoody, & Yang, 2012) making it the preferable option in dual processing. Conversely, heuristic processing is more likely to lead to temporary attitude shifts and is not a strong indicator of behavioral intent. This difference reveals that heuristic-based attitudes are not as stable, implying that a source credibility heuristic cue has the potential to temporarily influence a person's attitude or impact a person's political ideology, but that the change may be short-term.

Determining if a processing technique will cause a shift in attitude or behavior or if it will be used reinforce existing attitudes can be challenging. Research on health risk information indicates that systematic processing improves healthy behavior or leads to more health conscious

behavioral intentions. In the case of environmental risk information, research maintains that systematic processing leads to more stable, behavior-based beliefs (Griffin, Neuwirth, Giese, & Dunwoody, 2002); however, research does not indicate that information processing is necessarily capable of shifting environmental attitudes in favor of pro-environmental behavior. In fact, Fischer and Glenk (2011) determined that the systematic processing of policy information often results in processors choosing a policy option that was congruent with their pre-existing values.

This study considers the factors of the RISP model that impact perceptions of climate change risk based on pre-existing political ideology and the political ideology of message sources. Based on this knowledge of processing outcomes, the following hypotheses are presented:

H3: Results will indicate higher levels of heuristic processing, versus systematic processing, of messages being sent between persons of the same political ideology.

H4: Results will indicate higher levels of heuristic processing, versus systematic processing, of messages sent between persons of different political ideologies.

Methods

Participants. Data was collected through Qualtrics using convenience and snowball samples, originating in the northeast United States. Participants were recruited using social media, email, and in-person requests. Participation was on a voluntary basis and participants did not receive any compensation. The institutional review board at Bryant University approved the survey and data collection procedure. Participation was anonymous and participants were required to read and accept a consent form prior to beginning the survey. A total of 160 subjects made up the sample size and completed the survey. The sample was comprised of 64.4% female (n = 103), 32.5% male (n = 52), and 2.5% who chose not to identify (n = 4).

Participation was limited to citizens of the United States because the questions address information processing within the two-party American political system and participants needed the ability to actively participate in the American political landscape. The researcher required participants to be above the age of 18, but otherwise did not place any age constraints on participants because climate change affects the entire population. Participants' ages ranged from 20 years of age to 84 years of age, with a mean age of 37.9 years (*SD* = 16.5). Participants were also asked to self-identify their political ideology as liberal, independent, or conservative. The sample was 50.0% liberal (*n* = 80), 23.1% independent (*n* = 37), and 26.3% conservative (*n* = 42). The political ideology scale is a 7-point scale ranging from very liberal to very conservative and aims to determine which political ideology participants most strongly identify with. By allowing participants to self-select their political ideology in a single question the survey is capturing the participants' perceived political identity which helps to determine the political subjective norms that guide them by pinpointing which political group most closely reflects their perceived values and attitudes. While a multi-question scale may have been able to determine the exact political values and attitudes of the participants this would not achieve the purpose of the question which was to determine the political identity that may guide them to find certain political groups more credible and trustworthy than others based on participants' political identity, a component of social identity.

Procedure

For the purposes of this study, two mock statements from Congresspersons were created and randomly assigned to participants (see Appendix A). Both statements came from a Congressperson under the same gender-neutral pseudonym to eliminate any unwanted bias. The statements discussed climate change, its general impacts, and its impact in the United States. The

only difference between the two statements was the political identity of the message source—one statement was credited to a "Republican Congressperson" and the other to a "Democratic Congressperson." After participants read the assigned statement, they were asked to answer questions identifying their political ideology, attitude towards climate change, perceived hazard characteristics, negative affect, and processing behavior. Once the desired number of responses had been collected, the data was exported, cleaned, and imported to SPSS for analysis.

Measures. Perceived hazard characteristics are a dependent variable that is measured using two scales, perceived susceptibility and perceived severity (See Appendix B). Perceived susceptibility was measured with five items on a 4-point Likert scale from 1 (often) to 4 (never). Examples of items include; "How much do you think climate change will harm you and your family?" and "How much do you think climate change will harm people all over the world?" Conversely, perceived severity was measured with five items on a 6-point Likert scale from 1 (very threatening) to 6 (not a threat). These items were structured similarly to the perceived susceptibility items. For example, items asked "How serious is the threat to you posed by climate change?" and "How serious of a threat is climate change to the United States as a whole?" These scales were adapted from Yang et al.'s (2014) use of the perceived hazard factor of the RISP model in their study of processing and climate mitigation policy and earlier research from Kahlor et al. (2003). The perceived hazard characteristic scales assess the extent to which the participant believes climate change will harm themselves, their family, their community, the US, the global community, and nature. Both scales exhibited high reliabilities for perceived susceptibility (α = 0.93, M = 1.8, SD = 0.75) and perceived severity (α = 0.94, M = 2.3, SD = 1.2).

Negative affective response was scored using a 6-point scale that measured concern, worry, anxiousness, and negative feelings from 1 (i.e. not concerned) to 6 (i.e. very concerned). For

example, participants were asked “How worried do you feel about climate change?” and to what extent they have negative feelings about climate change. The negative affect response is adapted from a RISP study conducted by Yang and Kahlor (2012). The concern, worry, and anxiousness items were reverse coded. The negative affect scale was determined to be reliable at $\alpha = 0.78$ ($M = 3.0$, $SD = 0.98$) (See Appendix B). This scale evaluated how worried, concerned, and anxious respondents were about climate change and determined whether their overall feelings toward climate change were negative or otherwise.

The scales used to measure systematic processing and heuristic processing are both 7-point Likert scales ranging from 1 (strongly agree) to 7 (strongly disagree). Items for the systematic processing scale determine how strongly participants agree with statements like, “I found myself making connections between the story and what I’ve read or heard elsewhere” and “I thought about how the story related to other things I know.” Similarly, items for the heuristic processing scale determine how strongly participants agree with statements such as “I skimmed through the story” and “While reading the story, I focused on only a few points.” Like the perceived hazard characteristics scale, these scales were adapted from research conducted by Kahlor et al. (2013). Both the systematic processing scale ($\alpha = 0.79$, $M = 2.9$, $SD = 0.98$) and the heuristic processing scale ($\alpha = 0.81$, $M = 4.1$, $SD = 1.2$) were determined to be reliable (See Appendix B). These scales sought to measure the amount of cognitive effort a message receiver was outputting while reading the statement from the Congressperson.

Results

An independent samples t-test was used to determine if a statistically significant difference existed between conservative participants’ and liberal participants’ reactions to a climate change message from a partisan source. Hypotheses 1 through 4 considered the relationship between

political identities, perceived susceptibility to climate change, perceived severity of climate change, and participants' negative affective responses to a climate change message. The results aim to determine if the political identity of a message sender and a message receiver is a determining factor in how information about climate change will be processed.

Hypothesis 1 measures differences in how liberals felt about the three factors based on their reaction to a politicized climate change message. Results partially supported Hypothesis 1. There was a significant difference in perceived susceptibility, $p < .01$, $t(60) = 3.09$, for liberals who processed a message from a liberal source (M=1.61, SD=.498) versus a conservative source (M=1.32, SD=.324). Similarly, there was a significant difference between the perceived severity, $p < .01$, $t(59) = 2.93$, experienced by liberal readers based on the political ideology of the message sender; either liberal (M=1.93, SD=.688) or conservative (M=1.54, SD=.437). However, the means of the two treatment groups revealed that perceived susceptibility and perceived severity were more strongly felt by liberals who read a message from a conservative source than liberals who read the message from the liberal source which was not the hypothesized direction of the relationship. This relationship held true for negative affect in that the means reveal liberals had a stronger negative emotional response to climate change messages from a conservative source than a liberal source (See Table 1). Unlike the perceived hazard factors, there was no significant difference for negative affect, $p < .55$, $t(78) = 8.35$, between respondents given a liberal source (M=2.30, SD=.620) or a conservative source (M=1.72, SD=.728).

Hypothesis 2 estimated that conservatives would experience greater perceived susceptibility, perceived severity, and negative affect when they read a climate change message from a conservative source compared to a liberal political source. Results determine that, while conservatives and independents, on average, experienced more perceived susceptibility,

perceived severity, and negative affect (See Table 2) when processing messages from conservative sources than when they were processing messages from a liberal source. However, there was no significant difference between the two source treatments, liberal (M=2.05, SD=.91) and conservative (M=1.95, SD=.79), for perceived susceptibility at $p < .31$, $t(39) = 2.11$. Maintaining this trend of no significant difference, respondents who processed information from a liberal source (M=3.58, SD=1.60) expressed lower levels of concern than those who processed the message from a conservative source (M=2.67, SD=1.22) for perceived severity at $p < .07$, $t(40) = 2.08$. Additionally, there was no significant difference in negative affect, $p < .53$, $t(40) = 2.13$, between those that processed liberal (M=4.28, SD=.83) or conservative (M=3.65, SD=1.02) messages.

For research Question 1 a one-way analysis of variance (ANOVA) test was used to determine which source treatment and participant ideology combined to create the greatest level of perceived susceptibility, perceived severity, and negative affect. The result for negative affect reveals that liberals who received the conservative source treatment had the strongest negative affective response with M=1.72 and SD=0.74 compared with conservatives who received the message from a liberal source who expressed the lowest level of concern with M=4.28, SD=0.83 (See Table 3). The difference in negative affective response between groups based on source treatment was significant at $F(3, 119) = 57.48$, $p < .00$. This was the trend for both perceived hazard tests with liberals who received conservative source treatments exhibiting the highest levels of perceived susceptibility and perceived severity (See Table 4 and Table 5). The difference in perceived severity between groups based on the message sender's and message receiver's ideology was significant at $F(3,119) = 18.17$, $p < .00$. The difference between groups for perceived susceptibility was also significant at $F(3, 119) = 22.71$, $p < .00$. Moreover, the

difference between liberal's levels of concern when reading messages from a conservative source than when conservatives and independents read a message from a liberal source were all significant at $p < .00$ in post hoc tests.

Hypotheses 3 and 4 both predict that heuristic processing will be more common than systematic processing in circumstances where the message sender and message receiver have the same political ideology (Hypothesis 3) as well as when the message sender and receiver have different political ideologies (Hypothesis 4). The results do not support either of these hypotheses. Neither liberals nor independents and conservatives engaged in stronger heuristic processing, regardless of source treatment. The means for systematic processing and heuristic processing varied slightly depending on the source treatment and the political ideology of the message receiver (See Table 6 and Table 7). There was no statistically significant difference in how conservatives heuristically, $p < .55$, $t(41) = -.66$) or systematically, $p < .16$, $t(41) = 2.18$) processed based on source treatment. Conservatives' and independents' heuristic processing of messages from liberal sources was $M=3.79$ with $SD=1.30$ while systematic processing of the liberal source message was $M=3.55$ with a $SD=1.05$. Conservatives' and independents' heuristic processing of conservatively sourced messages resulted in $M=4.07$ with a $SD=1.04$ and result for their systematic processing of these messages found $M=2.93$ with $SD=.79$. Likewise there was no significant difference in how liberals heuristically, $p < .22$, $t(78) = .33$, or systematically, $p < .92$, $t(78) = 2.43$, processed climate change information based on source treatment. For self-identifying liberal respondents, heuristic processing of messages from liberal sources was $M=4.42$ with $SD=1.23$ while heuristic processing of messages from conservative sources was $M=4.33$ with $SD=1.04$. Self-identifying liberal respondents' systematic processing was $M=2.90$

with *SD*=.88 when processing the liberal message and *M*=2.41 with *SD*=.91 when processing the conservative message.

Discussion

Few communications studies on the Risk Information Seeking and Processing Model have focused solely on the element of political ideology, which is part of the individual characteristics factor that serves as the starting point of the model. This study seeks to determine the range and direction of influence political ideology has on factors within the RISP model (Griffin et al., 1999). Specifically, this study seeks to accomplish these goals in the context of climate change. The study determines that there are distinct relationships between political ideology and other factors in the model—perceived hazard characteristics and negative affect. Though the results do not unanimously confirm the study's four hypotheses, they provide important insights on how political ideology can impact attitude formation and information processing for politicized issues. The results indicate that the political ideology of the message sender and the political ideology of the message receiver can influence the degree to which the message receiver feels negative affect and perceives hazard after receiving climate change communication.

Climate change has been a highly politicized topic in the United States for over two decades. Given that the country operates under a two-party system, the issue is divided into two primary political schools of thought, both of which address whether climate change is occurring and how it should be addressed. Democrats are known advocate for more aggressive policies to combat climate change while most Republicans are somewhere on the spectrum of considering climate change to be an unproven phenomena to climate change policy presenting an economic risk. Ideologically, liberals align with Democrats and conservatives align with Republicans, reflecting the coinciding party stance on environmental issues. Therefore, this study accepts that self-

identified liberals generally support climate change policies while self-identified conservatives and independents are less inclined to support climate change policy. Furthermore, it is an expected social norm that Democratic political figures would favor climate change policy whereas Republican political figures would not. Based on these ideological divisions, we develop an important assumption for this discussion: it is widely expected that liberals and conservatives will hold contrasting opinions about climate change. This assumption is supported by the survey results which indicate liberal participants, regardless of source treatment, exhibit greater concern than the conservative or independent participants and confirming that the participants of this study represent expected social norms.

Communications scholars and social psychologists value study of the impact of politically sourced messages, as source similarity and source credibility can effect attitude formation in polarized political climates. In support of the idea that the information source can influence attitude and perception of a policy issue, this study finds that liberals and conservatives respond to climate change messages differently based on their political ideology and the ideology of the message source. Based on the findings presented here the role of issue salience and expectations violations may interact with the political identity of the message source to impact how climate change communications are processed. By understanding how political ideology effects information processing and attitude formation, scholars gain important insights about persuasive communication.

The test for Hypothesis 1, though not supporting the hypothesis, reveals a statistically significant difference between liberal reactions to climate change information from a Democrat source versus a Republican source. Liberal message receivers experience greater negative affect and perceive greater hazard when they receive climate change messages from a Republican

source than a Democratic source. ANOVA tests of perceived susceptibility, perceived severity, and negative affect reveal the same trend as Hypothesis 1 in that messages from Republican sources result in the highest levels of concern from liberal message receivers. For all items, participants who have a liberal ideology and received the Republican source treatment experience the greatest level of concern. The heightened level of concern among liberals receiving messages from Republican message sources can be explained by two common communication concepts: issue salience and expectations violations.

Boninger, Krosnick, and Berent (1995) include concern, caring and the amount of significance a person attaches to an attitude or value in their definition of issue importance. Research has determined that issue salience influences how and to what extent a person processes information, especially in the context of public opinion or policy attitudes (Cuik & Yost, 2016; Eagly & Chaiken, 1993; Yang et al., 2014b). Studies have found people are more likely to engage in systematic processing when issue salience is high (Ciuk & Yost, 2016). Higher issue salience and increased systematic processing counteract political party bias, meaning people who have higher issue salience and engage in more systematic processing are more likely to consider the policy information, not just the heuristic cue of political affiliation (Bullock, 2011; Jessee, 2010). Similarly, people are less likely to follow heuristic political cues when they have a more advanced understanding of the policy issue (Slothuus, 2010). Conversely, polarizing policy issues have been found to strengthen the influence of political cues like party affiliation (Druckman, Peterson, & Slothuus, 2013), in other words people typically stick with their political party opinion on issues that are publically controversial. Though climate change is a polarizing issue, the results of Hypothesis 1 and Research Question 1 support studies that indicate issue salience causes individuals to consider factors outside of political affiliation.

The results of Hypothesis 1 and Research Question 1 reveal that the highest levels of concern about climate change occur when liberals process messages from conservative sources. Overall, liberal message receivers have greater perceived susceptibility, perceived severity, and negative affective responses to climate change information coming from a Republican source than when they receive communications from a Democrat source. One potential explanation for the liberal participants' increased concern is that persuasiveness, or the influence of messages, is strengthened by the level of prominence the issue has for a person or the fear or anxiety the issue causes for a person (Arceneaux, 2012; Gadarian, 2010). Since liberals are more likely to consider climate change a prominent or fear-inducing issue, they will consider a message for its content rather than based on the political affiliation of the source. This theory may explain the results of this study in which environmental messages from opposing party affiliates actually led to higher levels of concern about climate change in people with high issue importance. In this instance, party affiliation works in conjunction with issue salience and policy information to strengthen pre-existing convictions or attitudes about climate change. The results differ greatly when evaluating the results for those who have lower issue importance, namely independent and conservative individuals.

Expectations violations theory also provides an explanation for the results of Hypothesis 1 and Research Question 1. Expectations violations theory addresses individuals' responses to violations of social norms and expectations (Eagly, Wood, & Chaiken, 1978). In this study, messages from Republican sources about the relevance of climate change issues violate expectations because of the politicized divide between Republican's and Democrat's attitudes towards climate change. Bergen (2012) used expectations violations theory to show that party labels, and therefore political ideologies, can influence attitudes when the information provided

is unexpected. In other words, political ideology or party labels can drive attitude formation when expectations are violated. In the circumstances laid out by this study, participants may have experienced higher levels of perceived hazard and negative affect because the message was coming from a source that typically offers an oppositional view to climate change. Participants therefore would be inclined to view the issue as more serious when an opposing party member voices concern for the climate.

While expectations violations theory presents one explanation for why liberals experienced the highest levels of concern about climate change when processing messages from conservative message sources, these results may also be explained by looking into the credibility of reluctant testimony. Reluctant testimony literature considers the persuasive impact of message sources that are reluctant to speak positively about a topic as compared to biased or objective sources. Reluctant sources are, in other words, message senders who are providing evidence or support that conflicts with their standard self-interest (Benoit & Kennedy, 1999). The literature on reluctant testimony finds reluctant testimonies to be more persuasive than testimonies from biased sources and equally as persuasive as objective testimonies (Benoit & Kennedy, 1999; Arnold & McCrosky, 1967). Since there is no variable for an objective source in this study, discussion will focus on the differences between biased sources and reluctant sources. For the purposes of this study, a statement in favor of climate action from a Republican source can be considered a reluctant testimony as it is largely a statement that conflicts with standard party agendas and voter expectations. Meanwhile, a Democratic source presenting a message about climate action could be consider a biased message given the Democrats' party line in favor of climate action.

Benoit and Kennedy (1999) improved on previous studies of reluctant testimony by removing an element of expertise from the comparison of different message senders. In other words, previous studies had failed to present message sources with the same perceived level of expertise on the topic which was being presented. By removing the element of perceived expertise, Benoit and Kennedy (1999) were able to determine that reluctant sources were more trustworthy. Similarly, Arnold and McCrosky (1967) found that reluctant sources had higher perceived levels of credibility which drove them to be better advocates and/or more persuasive. In this study, these factors have the potential to impact how messages about climate change from politically motivated sources are received. A message from a Republican source emphasizing the need for more action to protect the climate had a larger impact on liberal message receivers than a message from a Democrat source. This finding may indicate that the Republican source was considered more trustworthy given that they are presenting information which directly opposes their political interests as a member of the Republican Party in today's political milieu. In contrast, Democrat sources may be considered less trustworthy or credible if message receivers feel that they are speaking out of self-interest based on an existing political agenda.

However, while reluctant testimony literature may explain how the Republican source prompted stronger feelings of concern amongst liberal participants, it does not provide an explanation for the insignificant results for conservative participants despite the source treatment. The findings for Hypothesis 1, therefore imply that issue salience or existing policy attitudes remain a factor in how persuasive a message source might be.

Contrary to the findings for Hypothesis 1, Hypothesis 2 was not supported. When considering conservatives' and independents' expressed levels of negative affect and perceived hazard, there was no statistically significant difference between participants who received the

Republican source treatment versus those who received the Democratic source treatment. These results indicate that source treatment may not have the same impact on expressed levels of concern amongst conservatives and independent participants as it did on liberal participants. The lack of significant results may be accredited to the existing level of issue salience that self-identifying conservatives and independents had when they began the study. That is to say, lower issue salience regarding climate change could influence a message source's impact on participants' self-reported levels of perceived hazard and negative affective response. Bergen's (2012) research finds that party cues increase support among in-group members when there are no pre-existing policy attitudes or expectations. This reinforces the idea that issue salience may have an impact on participants' responses based on the amount of thought or cognitive energy a person has put towards a policy prior to receiving a persuasive message. However, without significant results for Hypothesis 2, this remains an area for future study in which issue salience's influence on the effectiveness or impact of environmental communication would need to be explored in greater detail.

Overall, the findings that political cues are persuasive within certain contexts, namely amongst liberal respondents, and that political elites can provide persuasive cues by violating expectations provide an explanation for the findings relating to Hypothesis 1 (Bergen, 2012). In this way, the levels of concern about policies or political issues may be formed by the source of the policy as much as they are formed by the policy itself. The results of Hypothesis 1 also contained a circumstance of expectations violations; in which a Conservative source expressed concern for climate change. Since liberals typically expect conservative communications regarding climate change to contradict their own attitudes towards the environment, the

unexpectedness of a pro-environment, conservative source appears to prompt additional alarm among liberal participants who are typically more eco-conscious.

Hypothesis 1 provides an example of how a message source's political ideology, issue salience, and expectations violations can work in tandem to impact how individuals process partisan communications. Druckman, Peterson, & Slothuus (2013) would explain these results using their findings that polarizing policy issues increase political affiliation along party or ideological lines. When people rely on political sources to form their attitudes on a policy issue such as climate change, cycles of political polarization can be reinforced (Bremer & Ley, 2013). Bremer and Ley's (2013) findings hold true in the instance of this study; however, in this case the political source that is driving the reinforcement and heightened level of climate change concern is actually of the opposing political ideology. Given the research on expectations violations and reluctant testimony, these findings are not altogether surprising. The results of Hypothesis 1 support the argument that political ideology have the potential to impact how persuasive climate change messages are for various message receivers. However, conditions around the level of issue salience and pre-existing expectations and the motivation of the source's testimony may impact the way and degree to which political ideology influences communication.

Both Hypothesis 3 and Hypothesis 4 were not supported. Despite the source treatments, all participant groups indicated higher levels of systematic processing compared to heuristic processing. Issue salience and processing ability are typically two indicators of how someone will process policy information (Brinsky, 2007; Bord, O'Connor, & Fisher, 2000, Eagly & Chaiken, 1993; Ciuk & Yost, 2016). People with lower issue salience will reserve cognitive effort for things they consider more salient, and will instead defer to heuristic cues, like political

ideology, to process information quickly (Ciuk & Yost, 2016). Similarly, people defer to heuristic cues when they are unable to gather information or understand an issue's complexity (Brinsky, 2007). Given these findings, the researcher expected participants to defer to heuristic processing for this study due to a lack of understanding of climate change science. However, despite indicators that heuristic processing is more frequently employed, the study results reveal that participants engaged in higher levels of systematic processing when reading the climate change statement from a Congressperson. These results could be explained by the survey circumstances or social desirability bias; however, both potential explanations are speculative as the survey did not inquire as to why a participant processed the statement in a particular way.

The survey directly asks participants to read a message from a political source before beginning the survey. The act of asking participants to consider the statement before proceeding may impact the level of cognitive effort they put towards processing the message. Since participants are being asked to read the message as part of the survey and they have, for some reason, decided to complete the survey, then they may be inclined to put a greater cognitive effort towards completing the survey. If participants encounter a politicized statement on climate change organically, then the way they would process the message may be different. For example, if a participant came across information on climate change from a political source when skimming the morning news or online, they may engage in a different level of processing. This survey may not have produced the same cognitive processing results as an organic read of the statement.

Social desirability bias could also explain the results of Hypothesis 3 and Hypothesis 4. Social desirability bias, the most studied type of bias in social science research, indicates that a respondent or participant in a study aims to provide *socially desirable* responses to questions

regarding personality or self-reported behaviors (Fisher & Katz, 2000). Social norms typically govern individuals' behaviors and attitudes and, when they do not, individuals are inclined to represent themselves in a way that makes them appear as though they acted in compliance with expected norms (Kreuter, Presser, & Tourangeau, 2008). Social desirability bias can result in relationships between variables (Malhotra, 1988) being suppressed or moderated by an influence outside of the study.

The survey questions on information processing are self-reporting questions in which the participant is asked to reflect on how he or she processed the statement by agreeing or disagreeing with statements such as "While reading the story, I did not think about the arguments presented," "I did not spend much time thinking about the story," or "I found myself making connections between the story and what I've read or heard elsewhere." These questions aimed to identify how participants were processing the information in the statement. The questions measuring systematic processing focused on how the readers may have linked the statement to other information in their life. The questions measuring heuristic processing focused on the amount of time the reader spent reading about or considering the statement as well as whether they felt the statement contained more information than they needed. The latter is not highly applicable because the statement was designed to be short and only contain a high-level discussion of climate change. The heuristic processing questions sought to determine if the reader had skimmed the statement, spent time thinking about it, or considered the arguments. However, these questions contained some negative language such as "I did not think about the arguments" or "I did not spend much time thinking about the story." This language made it clear that heuristic processing was the lesser form of behavior and could have instigated social desirability bias in that participants did not want to admit they did not consider a statement's

details at length. However, since the study did not measure for social desirability bias, this explanation for the results of Hypothesis 3 and Hypothesis 4 remains speculative.

Limitations and Future Directions

This study evaluates perceived hazard characteristics and negative affect within the framework of climate change and message source. Given this narrow focus, the results of this study are not generalizable to all communication scenarios. However, the insights gained from this research can be applied to climate change communication more broadly, as well as contribute to the understanding of political ideology's persuasive power in political communication. Despite the applicability of the results of this study, there are a few limitations that should be considered.

This study was conducted using a snowball survey in which the researcher and her network of peers, colleagues, and family members completed the survey and shared it with their personal networks via Facebook, LinkedIn, email, and in-person requests. This survey method does not ensure a random representation of the population. As a result, the participation in this survey was skewed and the sample population contained higher representation of women and liberal participants. Skewed demographic representation may have impacted the results of the study in that there was not equal representation on the basis of political ideology or gender. Though gender differences do not typically limit a study, the circumstance of studying climate change may provide a different case. Research conducted by the Pew Research Center determines that women in the United States report greater levels of perceived harm from climate change (Zainulbhai, 2015). In this study, $n = 98$ female participants self-identified as liberal and $n = 50$ self-identified as conservative or independent. With liberal female participants nearly doubling that of conservative and independent participants the results of this study may be limited. Where

liberals reflect higher levels of concern for climate change, as in the results for Research Question 1, the substantially higher representation from women may impact the populations' elevated climate change concern given that the Pew Research Center study reveals women in the US are already reporting higher levels of perceived harm. This finding indicates that factors outside of the source treatment may be impacting levels of perceived hazard amongst survey participants.

Due to the limitations in the participant collection process, some adjustments were made to the grouping of participants in the final analysis of data results. Specifically, independents and conservatives were grouped together to provide an equal counterbalance to the amount of liberal respondents. This grouping was also based on the expected level of concern and issue salience of climate change for these groups with liberals representing greater acceptance of climate change than independents and conservatives. Though this grouping strategy produced valuable results, this limitation could be eliminated in future research by analyzing independents as a standalone group alongside conservatives and liberals.

Issue salience was not formally measured in the survey and this is a limitation that can be remedied in future research. Though some questions in the survey addressed participants' opinions of climate change, the researcher did not use an issue salience scale to fully capture participants' attitudes about climate change in a way that would be useful to the study. Including a measure of issue salience would allow future research to confirm whether issue salience and information processing are correlated. Furthermore, inclusion of an issue salience measure would help researchers determine its impact the extent of influence political elites have on attitude formation or levels of concern about climate change.

Another limitation that should be considered is the structure of the source treatment which contained a message that was credited to a Republican or Democratic Congressperson. Using a Congressperson for the source treatment may have had some unintended effects due to the political climate in the United States. While the country is politically divided, distrust of government official and political actors remains high. Many Americans are jaded by governmental in-fighting and do not feel that political actors are concerned with the best interests of the American people. No matter the rationale, some Americans distrust government officials without discriminating based on political ideology. Due to pre-existing distrust, the survey results do not account for participants that are predisposed to skepticism about the motive behind messages from government officials. Future research may want to consider the credibility of different political sources such as judges, Senators, or House representatives. Moreover, future research could seek to identify the levels of trust or influence that state-level representatives have on their constituents versus federal-level representatives. Since this study has determined that political sources have the ability to influence levels of concern about climate change, it would be valuable to determine which political actors are the most influential. Considering the influence of message source on attitude and action regarding climate change would provide researchers with impactful takeaways for persuasive communication.

There are many other options for future research related to information processing and political or environmental communication. This study could be conducted on a range of polarized public policy issues to determine if political ideology, issue salience, expectations violations, or reluctant testimony theory produce the same results for issues like immigration, gun control, and abortion. By applying this study to other policy areas researchers could determine if these results are absolute or circumstantial. Additionally, future research could take

things a step further and consider how processing and the subsequent levels of concern about climate change translate into action such as voting behavior, recycling, or other environmentally-related behaviors. For example, research could ask participants if they intend to implement a certain behavior based on the statement. This could determine if conservatives would be moved to action based on information from a Republican source or if liberals are more active as a result of expectations violations.

Other factors related to the use of a snowball sample suggest avenues for future research as well. Specifically, the participants of this study were predominantly located in the northeastern region of the United States. The Northeast is experiencing climate change differently that other areas in the country. For example, if the sample was collected in California, a region plagued by drought, or in the southeast, where hurricanes have been increasingly severe, results may have been different. This suggests that targeting the sample collection process to a specific region experiencing specific climate change impacts could produce different results. By targeting the study to a specific region and a specific climate change issues, the study could determine how political messages and message sources are perceived and processed at the local level. Otherwise, this study may be facing a limitation by providing a message that is designed to capture the national impacts of climate change to a snowball sample with a majority of constituents concentrated in the northeast US states. This limitation could be rectified by making a pointed effort to collect participants from different regions and who represent a more balanced demographic mix.

Conclusion

This study produces a better understanding of how political ideology may impact the way public opinion is shaped for polarizing policy issues. By determining that the political ideology

of a message sender can influence the extent to which a person feels negative affect and perceives hazard characteristics about climate change, communicators can use message source as a tool for persuasion. The study also implies that the message source, the receiver's political ideology, and issue salience all influence the receiver's level of concern about a given policy issue. Future research should measure issue salience, as this study only implies that issue salience will impact how message receivers respond to a message from a politicized source but does not measure the level of issue salience participants were experience at the onset of the study. In the case of climate change, message receivers with high issue salience experienced greater levels of concern when a source from the opposing political ideology expressed concern for climate change. In contrast, message receivers with low issue salience experienced lower levels of concern when a source from the opposing political ideology expressed concern for climate change. Moreover, the influence of expectations violations would also be worth measuring. When expectations were violated and pro-environmental messages where shared by a conservative source, this study found that levels of concern about climate change were increased from the levels of concern seen in participants who received an expectedly pro-environment message from a liberal source. These areas indicate that there is much more to be studied to determine how climate change communications from politicians will be processed.

Table 1

Mean Responses from Liberals

Source Treatment	Perceived Susceptibility	Perceived Severity	Negative Affect
Liberal	1.6	1.9	3.0
Conservative	1.3	1.5	1.7

Lower means indicate greater concern

Table 2

Mean Responses from Conservatives/Independents

Source Treatment	Perceived Susceptibility	Perceived Severity	Negative Affect
Liberal	2.5	3.6	4.2
Conservative	1.9	2.7	3.7

Lower means indicate greater concern

Table 3

Mean Negative Affect based on Source Treatment and Message Receiver

Source Treatment	Liberal Ideology	Conservative/Independent Ideology
Liberal	3.0	4.3
Conservative	1.7	3.7

Lower means indicate greater negative affect

Table 4

Mean Perceived Susceptibility based on Source Treatment and Message Receiver

Source Treatment	Liberal Ideology	Conservative/Independent Ideology
Liberal	1.6	2.5
Conservative	1.3	2.0

Lower means indicate greater perceived susceptibility

Table 5

Mean Perceived Severity based on Source Treatment and Message Receiver

Source Treatment	Liberal Ideology	Conservative/Independent Ideology
Liberal	1.9	3.6
Conservative	1.5	2.8

Lower means indicate greater perceived severity

Table 6

Systematic Processing Mean based on Source Treatment and Message Receiver

Source Treatment	Liberal Ideology	Conservative/Independent Ideology
Liberal	2.9	3.6
Conservative	2.4	2.9

Table 7

Heuristic Processing Mean based on Source Treatment and Message Receiver

Source Treatment	Liberal Ideology	Conservative/Independent Ideology
Liberal	4.4	3.8
Conservative	4.3	4.1

Appendix A

Statement from Republican source:

Please consider the following statement from: Alex Rowan, Republican Congressperson

New and stronger evidence indicates that the changing global climate is impacting cities and families in every region of the United States. As a country, we depend on industrious cities, prolific farmlands, and protected public lands for healthy economic and social development. Our decisions as a nation have caused these pillars of society to become vulnerable. Improperly addressed environmental issues have led to increased coastal flooding, drought, and increasingly unpredictable climate patterns which put the economic well-being of the United States at risk. Likewise, contaminated drinking water and air pollution in cities and towns across the country threaten human health and the natural resources on which we depend. Clean air and clean water are not political issues, rather they are American issues and should be treated as such.

The topic of climate change, though politically sensitive, has been identified as a matter of national security and U.S. global interest by the Department of Defense. Energy security issues rooted in fossil fuel dependency, increasing refugee flows, and natural disasters are cited as active indicators of a changing climate which increases the risk of instability and conflict on a global scale.

Steps must be taken to protect our nation's economy, infrastructure, agriculture, water supply, and public safety in the form of environmental action and preparedness. Solutions for these environmental problems can only be achieved by working with partners in our local and national communities to prepare for and respond to climate change as a united entity.

These issues impact Americans' daily life and need to be addressed for the betterment of our nation. If left unaddressed, the consequences of a changing climate have the potential to

adversely impact all Americans and the first step to addressing this issue is to acknowledge that it exists.

Statement from Democratic source:

Please consider the following statement from: Alex Rowan, Democratic Congressperson

New and stronger evidence indicates that the changing global climate is impacting cities and families in every region of the United States. As a country, we depend on industrious cities, prolific farmlands, and protected public lands for healthy economic and social development. Our decisions as a nation have caused these pillars of society to become vulnerable. Improperly addressed environmental issues have led to increased coastal flooding, drought, and increasingly unpredictable climate patterns which put the economic well-being of the United States at risk. Likewise, contaminated drinking water and air pollution in cities and towns across the country threaten human health and the natural resources on which we depend. Clean air and clean water are not political issues, rather they are American issues and should be treated as such.

The topic of climate change, though politically sensitive, has been identified as a matter of national security and U.S. global interest by the Department of Defense. Energy security issues rooted in fossil fuel dependency, increasing refugee flows, and natural disasters are cited as active indicators of a changing climate which increases the risk of instability and conflict on a global scale.

Steps must be taken to protect our nation's economy, infrastructure, agriculture, water supply, and public safety in the form of environmental action and preparedness. Solutions for these environmental problems can only be achieved by working with partners in our local and national communities to prepare for and respond to climate change as a united entity.

These issues impact Americans' daily life and need to be addressed for the betterment of our nation. If left unaddressed, the consequences of a changing climate have the potential to adversely impact all Americans and the first step to addressing this issue is to acknowledge that it exists.

Appendix B

Concept	**Measures**
Political Ideology (1-7 scale)	Liberal…… Conservative
Attitude toward climate change (1-7 scale)	Learning about climate change is useful.
	Learning about climate change is beneficial.
	Learning about climate change is wise.
	Learning about climate change is valuable.
Perceived hazard characteristics	**Perceived susceptibility (1-4 scale)**
	How much do you think climate change will harm the following…
	You and your family
	Your local community
	The United States as a whole
	People all over the world
	Nature (not including humans)
	Perceived severity (1-6 scale)
	How serious is the threat to you posed by climate change?
	How serious of a threat is climate change to your local community?

	How serious of a threat is climate change to the United States as a whole?
	How serious of a threat is climate change to people all over the world?
	How serious a threat is climate change to nature?
Negative affect (1-6 scale)	How much of the following do you feel about climate change?
	Not concerned…… Very concerned
	Not worried…….. Very worried
	Not anxious…….. Very anxious
	I have negative feelings about climate change.
Systematic Processing (1-7 scale)	I thought about what action I myself might take based on what I read
	I found myself making connections between the story and what I've read or heard about elsewhere
	I tried to think about the importance of the information for my daily life
	I thought about how the story related to other things I know
	I tried to relate the ideas in the story to my own personal experiences
Heuristic Processing (1-7 scale)	I skimmed through the story
	While reading the story, I focused on only a few points
	I did not spend much time thinking about the story
	The scenario contained more information than I personally needed
	While reading the story, I did not think about the arguments presented in the story

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