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Promoting Greater Granularity in Climate Research: A Case Study Analyzing Perceptions of Anthropogenic Climate Change Among Students, Faculty, and Staff at The University of Southern Mississippi

Kelly Wegmann

PROMOTING GREATER GRANULARITY IN CLIMATE RESEARCH: A CASE STUDY ANALYZING PERCEPTIONS OF ANTHROPOGENIC CLIMATE CHANGE AMONG STUDENTS, FACULTY, AND STAFF AT THE UNIVERSITY OF SOUTHERN MISSISSIPPI

by

Kelly Wegmann

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Committee:
Dr. David M. Cochran Jr., Committee Chair
Dr. Clay S. Tucker
Dr. Kayla D. Stan

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ABSTRACT

Anthropogenic climate change is a global concern that has the possibility to become the next world-altering event. While there is a substantial amount of scientific evidence proving its existence and harmful repercussions, there is still a lack of belief in its occurrence within the United States. This research uses survey data obtained from the University of Southern Mississippi to provide an understanding at a local scale of how both physical and psychological aspects bridge a gap in perception research.

With the use of previous research done by the Yale Program on Climate Change Communication (YPCCC) and George Mason University Center for Climate Change Communication (Mason 4C), I compare survey results on climate change belief as well as perceptions of risk. Additionally, I assess psychological influences on climate perceptions using the Moral Foundations Theory, as well as obtain differences in views based on generation. In this thesis, I validate risk perception, morality, and generations each as useful methods in understanding climate perceptions. These results demonstrate the need for more granular-level research to understand how perceptions are presented.

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self-care. Her pure optimism, resilience, and strong independence are characteristics I try to replicate in my own life. Both of my sisters have consistently been a place of joy to return to throughout this entire process.

Finally, I truly owe everything to my mom and dad. Even 600 miles away they never stopped supporting me in every way they could. They answered whenever I called, believed in me when I thought I could not take on such a project, and loved me every step of the way. Their continued support and contribution made where I am today possible.

DEDICATION

This work is dedicated to Clare, Charlotte, and Baby B. They are the next generation of Real. Strong. Women. and I hope to do my little part in leaving them the Earth better than I found it.

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GHG	Greenhouse gases
IPCC	Intergovernmental Panel on Climate Change
IRB	Institutional Review Board
K-W	Kruskal-Wallis Test
MASON4C	George Mason University Center for Climate Change Communication
MFT	Moral Foundations Theory
MFQ	Moral Foundations Questionnaire
PCA	Principal Component Analysis
USM	The University of Southern Mississippi
YPCCC	Yale Program on Climate Change Communication
YCOM	Yale Climate Opinion Maps

CHAPTER I – INTRODUCTION

1.1 Biographical Preface

I grew up in a middle-class family in Dallas, Texas. We recycled everything we could, walked to school, rain or shine, turned off all the lights when we left a room, ate every bite on our plates at dinner, and rinsed shampoo bottles out for as many showers as possible until they no longer produced bubbles. The majority of these actions were initially implemented with regard to saving money, but I am now able to recognize these small actions as catalysts for a greener approach to life. To this day, I have never lived through my house flooding as a result of a hurricane or catching fire due to wildfires in the area. The effects of climate change have never substantially impacted my life, but my childhood was built on a foundation that prioritized the environment, which explains my awareness and concern as an adult.

I was frustrated when I began research for this thesis. I could not comprehend why people did not understand that anthropogenic climate change is a major threat. Back then, I had spent the past four years surrounded by family, peers, and professors all exhibiting a passion for climate science and promoting every way each individual had the opportunity to do something about the state of the planet. I was so involved and consumed by this idea that I had chosen to dedicate my entire graduate career to the matter, but I quickly realized that my anger was not valid and that my frustration was aimed in the wrong direction.

Most people, including myself, do not readily take time to consider charts and numbers or make hard, life-altering decisions concerning topics that they are not well-versed in. If researchers were to alter their methods and display the dangers of

anthropogenic climate change in a manner that humanity can easily relate to, process, and communicate, that would alter the world views and begin a huge step toward mitigation efforts. My frustration now lies heavily with the idea that while there is no shortage of climate change data available, the granular-level research promoting the psychology associated with climate change, societal motivators, and accurate representation of perceptions is not more prominent in the climate conversation.

1.2 Research Problem

The highest average global temperatures yet recorded occurred in July 2023 (O'Shea, 2023). The Amazon rainforest and the southern United States are experiencing record droughts that could lead to entire shifts in the compositions of their biomes (MacPherson, 2023). Wildfires decimated Lahaina, Hawaii only months after the New York skyline resembled a post-apocalyptic film with its yellow hues brought on by smog from high-latitude forest fires in Canada (Moore, 2023). Glaciers in Alaska are melting at unprecedented rates, and record-breaking sea surface temperatures are occurring throughout the North Atlantic Ocean (Wolken and Jones, n.d.: ECMWF, 2023). Even with the seemingly constant stream of disasters associated with global warming and the enormous body of literature on climate change, the national average for the belief regarding the existence of global warming is only 72% (Leiserowitz et al., 2023). This was reported in a survey distributed by the Yale Program on Climate Change Communication (YPCCC) and George Mason University Center for Climate Change Communication (Mason 4C): *Climate Change in the American Mind: Beliefs & Attitudes, Fall 2023*. Given that over 25% of the United States population does not believe that climate change is actually occurring, we should better discuss other factors influencing

belief beyond the collective agreement of scientists and the direct exposure of the United States population to climate-change-influenced natural disasters.

The common sayings among climate activists, “There is no Planet B” and “We are killing the planet,” are not entirely truthful. The former can be opposed by individuals like Elon Musk. He is rapidly advancing technology in hopes of trying to see if life on other planets is viable (Musk, 2017). The latter is incorrect because while *Homo sapiens* have only been around 300,000 years, the earth has survived a constantly changing climate during its approximate 4.5 billion years of existence (Smithsonian's National Museum of Natural History, 2021: National Geographic, 2024). Whereas the earth can survive repeated global warming, contemporary biological life, including humans, might not. Even if our technology were to reach a point where humans could colonize other planets, can we trust humanity enough not to repeat the same mistakes of living out of balance with the biosphere?

Humanity has dealt with multiple catastrophic events throughout its existence, but knee-jerk reactions that seek a resolution are primarily reserved for where people can directly see and feel the effects. We just witnessed COVID-19, a pandemic that affected the entire planet. As healthy people died at alarming rates, much of the world shut down to combat further spread of the virus and lessen its impacts (Vicentini et al., 2020). It was an intense response to a visible threat, displaying that the world prioritized its health and survival during this time.

Such a dramatic response has not occurred with anthropogenic climate change. Unlike the response to COVID-19, climate change has had a slow build-up, measured not in days or months, but in years and decades. Studies of anthropogenic climate change

date to the late 1800s, but even now, the global public has yet to display a united front (NASA, 2023). COVID-19 had the anti-vax movement, in which individuals pushed back against mitigations often due to their misunderstanding of the science. Even with this resistance, the combined efforts of countries, corporations, and individuals were able to combat the disease and lessen its damage. Global warming needs the same type of attention, and focusing on why people do or do not believe in anthropogenic climate change will help further research promote mitigation.

Global warming is usually explained using statistics (Vainio and Paloniemi, 2013). This leads to a lack of personal connection to the severity of anthropogenic climate change. Numbers and graphs do not capture the layperson's attention and instill belief or inspire action as much as a personal connection (Toomey, 2023), and while news stories and social media posts are consumed with the climate's affects, there is minimal visible and relatable evidence portraying an aggressive response. Likewise, such a response asks people to go outside of their comfort zones, limit their selfish impulses, and focus on hard short-term change that brings long-term gain, even if that gain stretches beyond the span of their lives. Research must concentrate on relating to people's humanity so these uncomfortable realities can be accepted. In order to accomplish this, the focus needs to follow internal motivators, cultural dynamics, and a deeper understanding of what influences a coherent front for change.

Prior research has analyzed climate perceptions within higher education (Jacquemin, Stofer, and Newberry, 2022: Stavrianakis and Farmer, 2023: Mbah, 2024). There is also extensive insight into risk perception associated with climate change, and multiple studies have assessed responses to this risk within the American Southeast (Bilal

and Rossi-Hansberg, 2023: Reed, Mason, and Ekenga, 2020: Himmelfarb et al., 2014: Taylor, Bruine de Bruin, and Dessai, 2014: Sullivan and White, 2019). Generational differences have been proven to appear when discussing climate perceptions, and the Moral Foundations Theory has been shown to accurately associate morality with a response to global warming (Capoano, Balbé, and Costa, 2024: Jansson and Dorrepaal, 2015: Culiberg et al., 2022: Bretter et al., 2023). My study is the first to investigate all these aspects at the same time within one institution of higher education.

This thesis combines human and environmental geography to analyze human perceptions regarding climate change shown within the University of Southern Mississippi (USM). I document perception through the lenses of risk awareness, moral foundations, and generational differences. Using risk awareness, I associate belief in climate change with levels of worry and responsibility. I connect why individuals view situations as morally right or wrong to their perceptions of climate change opening better avenues for discussing climate change on a more personal level. Lastly, I introduce the idea of generational differences in perception to provide more insight into various societal cohort's actions.

1.3 Preliminary Projects

Belief in climate change in the United States is characterized by a considerable amount of variation across geographic space. As part of this preliminary assessment, I ran a Local Moran test on survey data provided by YPCCC (Howe et al., 2015). The Local Moran compared climate change belief within surrounding counties to measure whether the attitudes were clustered, random, or dispersed (See Figure 1.1).

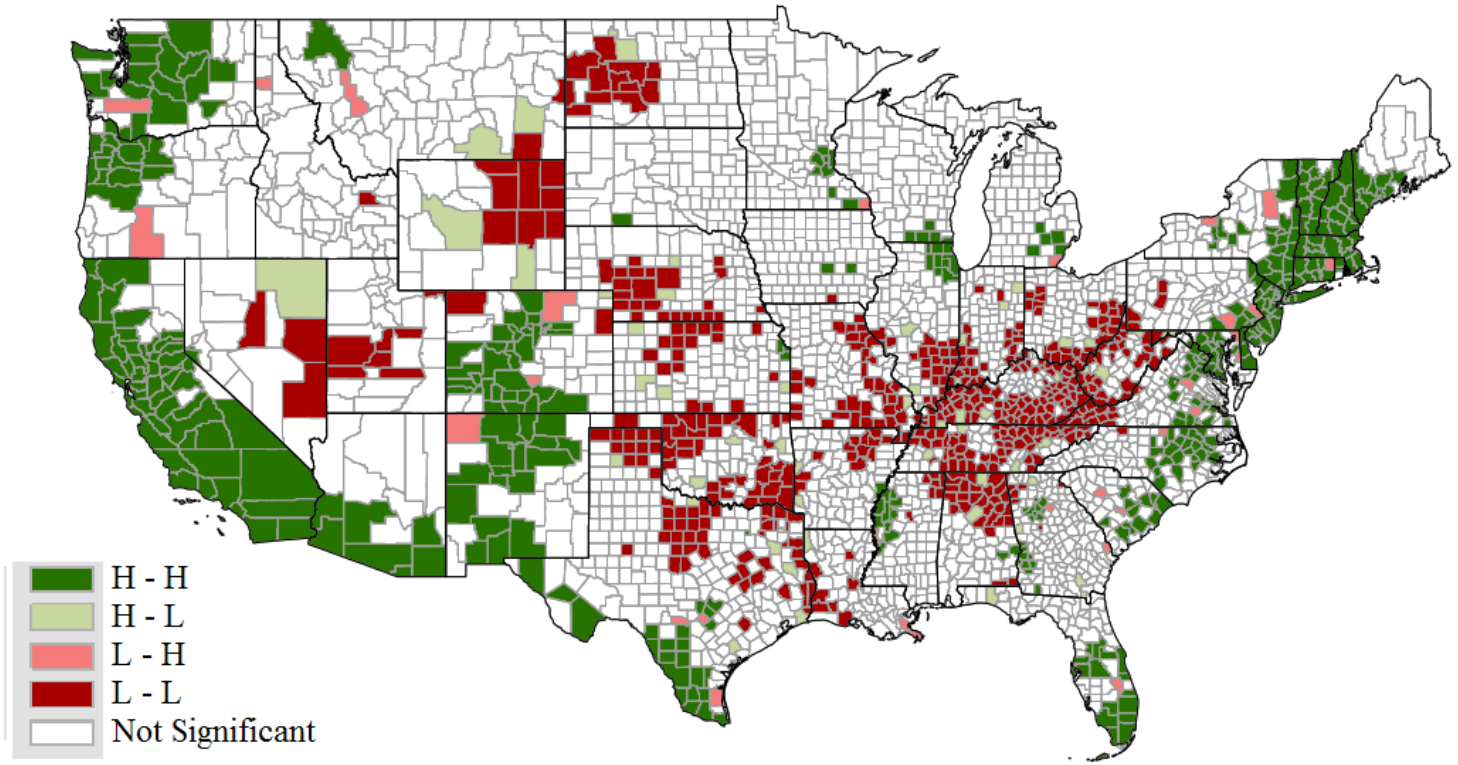

Figure 1.1 *Clusters of Climate Change Belief*

Figure 1.1 displays the local clustering of climate change belief using survey data provided by YPCCC (Howe et al., 2015). The Local Moran 1 provides a spatial autocorrelation at the county level of answered belief and non-belief throughout the United States. Dark green displays high belief surrounded by high belief (H – H). Light green indicates areas of high belief surrounded by areas of low belief (H – L). Light red shows areas of low belief surrounded by areas of high belief (L – H). Dark red displays low belief surrounded by areas of low belief (L – L). White displays areas where there is no significant clustering of belief or non-belief.

There is an absence of significant clustered belief across the American Southeast, which I believed displayed a gap in our understanding regarding climate change perception among the residents of this region.

Regions are defined by cohesive physical and cultural characteristics, yet they do not always have strict physical boundaries, and therefore they also lack a universally agreed upon border. The American Southeast is no exception to this (Heatwole, 1978). For the purpose of this thesis, I include Texas, Louisiana, Mississippi, Alabama, Georgia, and Florida within what I label as the Southeast. Geographically pinpointing accurate perceptions of global warming can prove vital as the collective view of a region's individuals, local government, school systems, and communities can provide a substantial impact on policies, education, and action toward climate change (Shao and Goidel, 2016). Insight on whether or not there is a shared view allows for direction on how to further address the state of the situation.

In other preliminary analyses, I ran a Principal Component Analysis (PCA) (Figure 1.2). This correlates climate perceptions stated by Howe and others (2015), age and gender data from the United States Census Bureau (2021), average annual precipitation data from NOAA (2022), average annual income data from the United States Census Bureau (2020), election data from MIT Election Data and Science Lab (2018), flood data from FEMA Disaster Declarations Summaries (2022), and finally the percentage of a county that went to a religious service using a U.S. Religion Census Religious Congregations and Membership Study (Grammich et al., 2012). The PCA allows each of these multiple variables to be measured and correlated on a singular

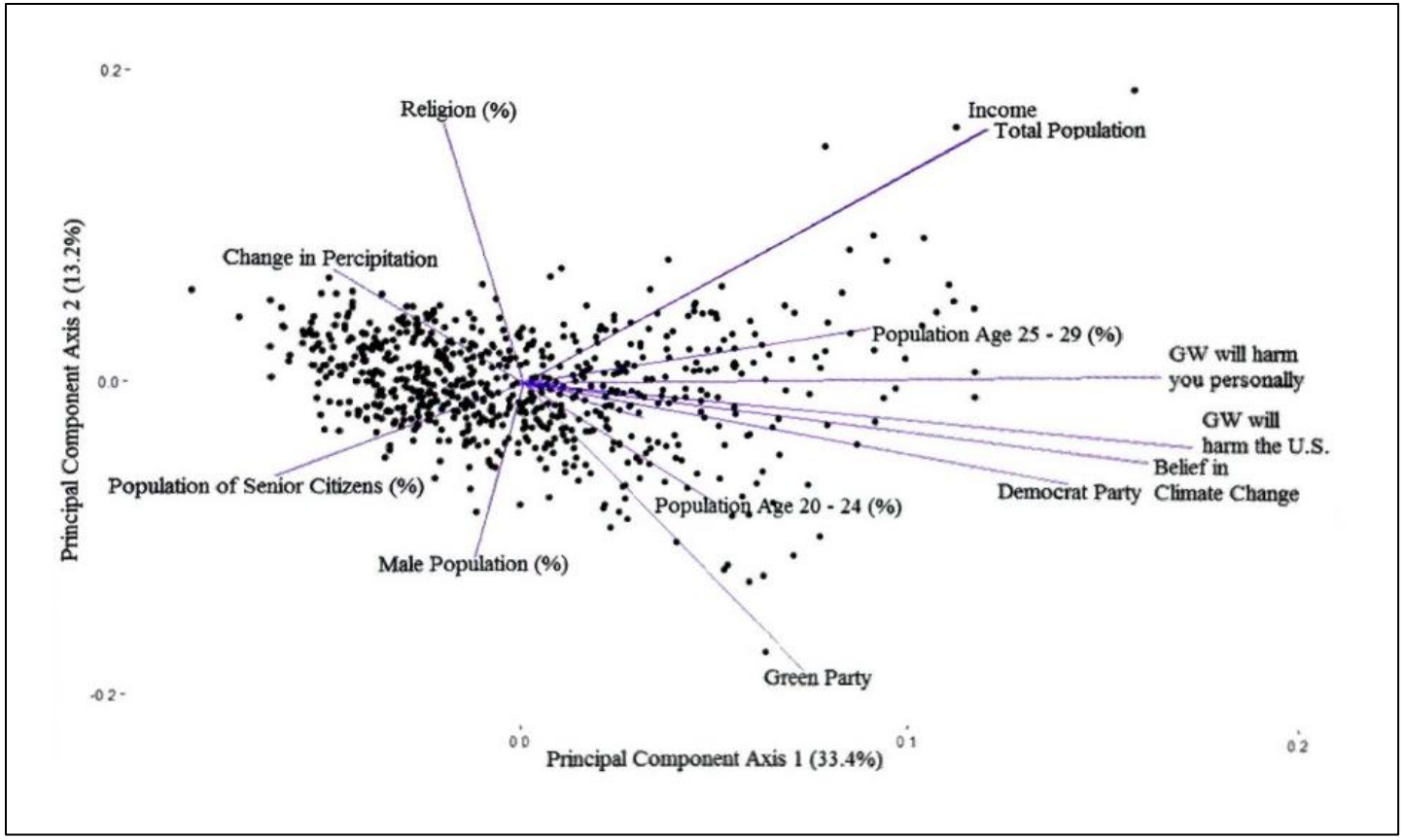

Figure 1.2 *Principal Component Analysis Relating Demographic Influences on Belief in Climate Change*

Figure 1.2 is a PCA displaying correlations between belief in climate change, environmental factors, and demographic data. PCA Axis 1 presents a strong correlation to belief in climate change, democrats, the percent of the population that is 25 – 29 years-old, and a belief that global warming will harm the United States as well as the individual respondent

2-D graph, and inevitably gave rise to the possibility that belief that climate change varies according to age. There is a strong positive correlation between the percentage of the adult population aged 20 to 29 and the belief that climate change is occurring. Additionally, the percentage of senior citizens aged 65 and over has a negative relationship with the belief that climate change is occurring.

1.4 Research Questions

This study narrows in on a singular institution of higher education and assesses a person's perceptions of global warming based on risk perception, morality, geographic location, and generational differences to promote further granular research. The questions I hope to answer by combining these avenues of research are as follows:

- RQ1 - How do perceptions of climate change appear within The University of Southern Mississippi, and how do they compare to the data presented by Yale?
- RQ2 - Does morality, based on the five core moral foundations established in the Moral Foundations Theory, influence belief in climate change?
- RQ3 - Do the data obtained from my survey support the lack of clustered belief found in the southeastern region of the United States?
- RQ4 - Will those surveyed display generational differences in belief in climate change?

1.5 Outline

In this chapter, I give a brief introduction explaining the importance of having an awareness of anthropogenic climate change. I have introduced the purpose of my research, the methods that led me to my final research questions, and then list those questions I set out to answer.

In Chapter II, I continue to explore literature addressing each subject related to my research questions. The subjects include an overview of the principles of climate change, risk perception, the outside models of YPCCC and MFT, and generational differences.

In Chapter III, I discuss the specific methods and means of analysis used to answer the determined research questions. I give a complete overview of my survey instrument as well as how the tool was implemented. I explain the use of Qualtrics, and other programs used to analyze the data received from the questionnaire. Furthermore, in Chapter IV, I present the results from each of these analyses. I discuss the significant and non-significant relationships between the responses to the questionnaire and provide figures demonstrating the correlations between climate change perceptions, moral foundations, their geographic distribution, and generations.

I end with the final chapter, Chapter V, in which I include my closing thoughts on how the survey results answer each research question. I return to the research problem and discuss how this thesis addresses what gaps exist within climate change perception. I end with the importance of further researching these different avenues of perception at a local level.

CHAPTER II – LITERATURE REVIEW

2.1 Understanding the Basics of Climate Change

CO_2, CH_4, N_2O, and anthropogenic gases that contain fluorine, also referred to as fluorinated gases, are together the primary emissions preventing long-wave infrared radiation from escaping the atmosphere. This trapped energy increases the temperature of the atmosphere, oceans, and land (Armstrong, Krasny, and Schuldt, 2018). The natural variability in Earth's atmosphere is overshadowed by anthropogenic forces (Lee, Freudenburg, and Howarth, 2012). The increase in greenhouse gases (GHG) is amplified through industrial, household, and commercial uses (U.S. Environmental Protection Agency, 2016).

The Intergovernmental Panel on Climate Change (IPCC) formed in 1988 and is currently the leading international body in publications and knowledge regarding climate change science (IPCC, 2021). The IPCC released a *2023 Synthesis Report as a Summary for Policymakers, 8596*, which claims that global surface temperature was 1.09°C higher in 2011–2020 than 1850–1900. The IPCC attributes over half of this warming to the increasing presence of GHG (Lee et al., 2023). An increase of 1.5°C has been customarily used by climate change researchers to create models that display how the Earth will change with the higher temperatures. If global temperatures increase 1.5°C, some of the repercussions would include species loss, increased human health risks, and natural disasters occurring at higher frequencies and with greater intensities (Allen et al., 2018). The coastal United States will be particularly impacted by sea-level rise, ocean heating, tropical cyclone activity, flooding, and erosion (Scavia et al., 2002). The fact that global surface temperatures are projected to reach the 1.5°C increase by 2040 has been

widely disseminated across the mainstream media, yet there is still a disconnect between these facts, which are broadly accepted by the scientific research establishment and those who do not accept the reality of anthropogenic climate change (Lee et al., 2023). This lack of cohesive understanding underlines the presence of other factors influencing perceptions of climate change.

2.2 Risk Perception

Perceptions of risk can determine behavioral intentions, and experiencing the effects of global warming can raise risk perception (O'Connor, Bard, and Fisher, 1999). Climate risk, such as periods of high temperature and sea-level rise, increases people's belief in climate change (Taylor, Bruine de Bruin, and Dessai, 2014). These personal experiences influence belief more than prior knowledge and assumptions, leading people to act over their present political or cultural views (Myers et al., 2013; Akerlof et al., 2013). This ranks risk perception above other socioeconomic factors when analyzing perception.

Van Valkengoed, Perlaviciute, and Steg, (2024), discuss risk perception and the influence household-level interactions can have in making a difference. They agree that people are more likely to act if they believe in climate change as well as the harm it ensues, and through asking a population located in the Netherlands about their perceived risk regarding increasing temperatures and flooding, they displayed that climate perception is an important factor when discussing adaptation policies. While research builds on risk perception benefitting climate perceptions and the need to adopt a responsibility to act, there is still the notion that climate risk alone is not enough to promote the amount of change needed. Van der Linden (2014) distributed a survey

documenting behaviors and perceptions related to climate change across the United Kingdom detailing that risk perception relating to climate change is unique because of the notion that risk is a mental construct and the effects of climate change are hardly directly seen in one's daily life.

Sullivan and White (2019), analyzed areas where water management was scarce, and the researchers concluded that only 60.1% perceived climate change as risky. If barely more than half of the population sees climate change as a potential risk, especially when they are currently undergoing climate-related crises, there might not be enough of a political consensus to influence appropriate policy change. This continues to apply to the United States as a whole, because an even smaller percentage, 46%, perceives a risk related to global warming (Howe et al., 2015).

Risk perception does not fully alter the public's beliefs or actions enough to begin mitigation (Horsney, 2016: Bergquist and Warshaw, 2019). Therefore, other avenues, both physical and psychological, must also be researched in conjunction with this concept to create a comprehensive overview of perceptions of anthropogenic climate change.

2.3 Geographic Distribution of Perceptions

The American Southeast is particularly exposed to the consequences of climate change (Bilal and Rossi-Hansberg, 2023). Reed, Mason, and Ekenga (2020) discuss flood management stakeholders acknowledging the importance of combating the effects of climate change within the region, but this specialized view held by stakeholders needs to be reciprocated by the entire region. Shao and Goidel (2016) evaluated a wider population by combining survey and environmental data to assess the Gulf Coast residents' perceptions of climate change relating to local climate patterns. They found

limited correlation between the two (Shao and Goidel, 2016). A more granular level view, using an ethnographic approach to study the state of Georgia and climate perceptions, included the argument that perceptions of climate change rely on multiple outside factors such as religious affiliation, political party, economic status, and personal experience (Himmelfarb et al., 2014).

2.3.1 Climate Change in the American Mind

The YPCCC is a leading organization that conducts scientific research on public climate change knowledge, attitudes, policy preferences, behavior, and the underlying psychological, cultural, and political factors that influence them (Yale Program on Climate Change Communication, 2023). In 2008, a joint effort between the YPCCC and Mason4C led to a series of publications: *Climate Change in the American Mind*. These are comprehensive public opinion polls that analyze and document perceptions of climate change across the United States (Mason 4C Team, 2024). These institutions update the study every two years, with the latest version presenting the findings for the fall of 2023, which were released in January 2024 (Leiserowitz et al., 2023). The report is based on findings from a survey which was conducted between October 20 and 26, 2023, and which is stated to represent the national perceptions of the United States population. The research team interviewed 1,033 adults, and their average margin of error is +/- 3 percentage points at the 95% confidence level (Leiserowitz et al., 2023). Their findings, which are displayed in the "Yale Climate Opinion Maps" (YCOM), illustrate diversity of climate change perception across the country, although map accuracy diminishes in areas with smaller populations and lower population density (Marlon et al., 2023).

2.3.2 Mississippi's Placement in the Southeast

The population of Mississippi accounts for less than 1% of the population of the United States. The state's population is mainly encompassed by the Jackson Metropolitan Area, the Hattiesburg area, and the Gulf Coast Region, with the remainder dispersed across the rural counties that surround the urban areas (Maternal and Child Health Bureau, 2021). The Southeastern region of the United States embodies diverse cultures and varying population densities. Mississippi is no exception, but it also carries one of the most negative reputations of the American Southeast as a result of its history. With its persistently high poverty rates, nationally low educational attainment, and dark history of racism, the adage "Thank God for Mississippi," is often exclaimed by other southern states in appreciation for not being at the bottom of the rankings (Buras, 2015: Maternal and Child Health Bureau, 2021).

2.4 Moral Foundations Theory (MFT)

MFT was first conceptualized by social and cultural psychologists. The theory is an explanation of a conceived moral matrix that the world acts on, and their work provides researchers with a common language when discussing morality (Graham et al., 2013). I integrated this theory into my research to reach an understanding of perception that would be incomplete without both human and environmental factors. With influence from Fiske's theory on relational models and Shweder's theory of the three ethics, MFT offers a dynamic framework for moral judgments across time and societies (Graham et al., 2013).

2.4.1 Assumptions and Criteria

MFT relies on four base assumptions: nativism, cultural learning, intuitionism, and pluralism. These assumptions, along with five additional criteria for *foundationhood*, provide validity in its ability to distinguish this deeper understanding of morality (Graham et al., 2013).

Nativism refers to the idea that some aspects of morality are innate, human characteristics. Graham and others (2013) refer to nativism as being born with a "first draft" of moral tendencies that is later revised through life experience. The second base assumption, Cultural Learning, addresses morality that is influenced by situational aspects, such as participating in religious practices at a young age (Graham et al., 2013). Intuitionism refers to humans making moral judgments initially based on emotional reactions, followed by rational decisions (Graham et al., 2013). Lastly, Pluralism corresponds to the idea that there is more than one moral foundation (Graham et al., 2018).

The five criteria for *foundationhood* were established to provide assurance that each moral foundation was not arbitrarily chosen (Graham et al., 2013). The first criterium is that the foundation must appear as a common concern in third-party normative judgments. This means that any of the determined foundations must appear as an overall subject when making moral judgments not only for oneself, but when the person has no direct consequences (Graham et al., 2013). The second and third criteria assure that in order to be considered as a foundation, the moral response must come as an immediate reaction to the situation at hand and occur within most cultures (Graham et al., 2013). The fourth criterium refers back to the base assumption of nativism, and that

morality is organized before experience. It ensures that these foundations are seen being acted upon before children have any outside teaching or influence (Graham et al., 2013). The final standard for *foundationhood* is that the evolutionary models demonstrate the foundation has the adaptive advantage (Graham et al., 2013). With these requirements, MFT acknowledges Care, Fairness, Loyalty, Authority, and Purity as the five original foundations from which one establishes moral judgments (Graham et al., 2013).

2.4.2 The Five Foundations

The original framework of MFT defines moral values by the five rudimentary functions: Care, Fairness, Loyalty, Authority, and Purity (Graham et al., 2013). It is important to note that there is ongoing research separating the foundation of Fairness into Equality and Proportionality, as well as adding Liberty, Honor, and Ownership (Atari et al., 2023: Moral Foundations Theory, n.d.). This work is not expected to be made publicly available until August of 2024, so it has not been included as part of the theoretical framework of MFT that I have employed for this thesis research (Atari et al., 2023).

MFT was conceived by identifying adaptive challenges of social life that regularly appeared in works written by evolutionary psychologists. These challenges were connected to virtues found across cultures (Haidt, 2012). *Care* is derived from humanity's need to protect and care for children, but has evolved through time to include an aversion to anyone's pain (Jansson and Dorrepaal, 2015). This code of conduct is triggered when someone witnesses suffering or distress, leading those relating strongly to this foundation to despise cruelty and express virtues like gentleness, compassion, and empathy (Haidt, 2012: Jansson and Dorrepaal, 2015). *Fairness* is found when someone

regulates or suppresses their self-interest due to a sense of justice. It is associated with cooperation and underlines concerns for equitable treatment of others, motivating social equality (Haidt, 2012: Jansson and Dorrepaal, 2015: Argüello-Gutiérrez, López-Rodríguez, and Vázquez, 2024: Landmann and Hess, 2018). *Loyalty* relies on one's actions being focused on their ingroup. Historically, humans have embraced a sense of tribal psychology so thoroughly that it appears in modern society through campanilismo, which is a sense of pride for one's hometown, patriotism, and even self-made groups, such as supporting one's school or sports team (McGinley and Shi, 2024: Haidt, 2012). Those who align themselves with *Loyalty* would see any betrayal or threat to this ingroup as immoral (Haidt, 2012). *Authority* values tradition and leadership. Those who adhere to this moral foundation respect legitimate positions of power, and anything seen as disobedient, disrespectful, or defiant acts as a trigger (Jansson and Dorrepaal, 2015: Haidt, 2012). The final foundation, *Purity*, can also be referred to as sanctity. This was shaped by humans' need to avoid contamination but developed into acting based on respect for both physical and metaphysical sacredness and in opposition to anything associated with the emotion of disgust (Haidt, 2012: Argüello-Gutiérrez, López-Rodríguez, and Vázquez, 2024). Those who view pollution, racism, and unchaste human behaviors as morally wrong align with this foundation. This foundation also contributes to the moral underpinnings of the environmental movement because proponents argue that pollution and industrialization violate the purity of nature (Jansson and Dorrepaal, 2015).

2.4.3 Climate Perceptions' Correlation to MFT

Assessing one's perception of these moral drivers and making a connection to their perception of climate change provides a theoretical pathway to tie the roots of one's moral beliefs to their stance on the global issue. Climate change is a social dilemma that can be fundamentally related to both human society and nature (Capstick, 2013). Dickenson and others (2016) claim that people act out of cognitive biases over belief, and an examination of values has the ability to communicate peoples' reactions and motivations effectively. Without using Moral Foundations Theory, Hormio (2023) still discusses climate change as a moral responsibility. She even uses key terminology such as justice and harm when explaining factors in determining a responsibility towards climate mitigation factors found throughout her exploration through climate ethics literature. Culiberg and others (2022) continue the conversation by using an online consumer panel in the United Kingdom to determine the importance of MFT when assessing an environmental responsibility regarding reducing consumption, and Bretter and others (2023) continue to connect morality and food waste.

MFT looks at experience-related behavior, social interactions, organizing people's values, and interpersonal relationships (Dawson and Tyson, 2012: Graham et al., 2013). This is pertinent to the idea of climate change as a social dilemma because while someone might not be personally experiencing the effects of climate change, their connection to community and authority leads them to perceive it through their own moral lens. Climate change has become increasingly politicized, making political affiliation an important predictor of climate change perception (McCright, Dunlap, and Marquart-Pyatt, 2016: McCright and Dunlap, 2011). From the standpoint of MFT, *Authority*,

Loyalty, and *Purity* are all foundations associated with Republicans, whereas *Care* and *Fairness* are stronger among Democrats (Ballew et al., 2019). Those who score higher in *Care* and *Fairness* are also seen to have a positive awareness regarding climate change, with *Authority* having a negative relation (Jansson and Dorrepaal, 2015). If one is going to attain a common ground of belief in climate change it is clear they have to appeal to their driving values separately (Wolsko, Ariceaga, and Seiden, 2016).

2.5 Generations

The term *generation* represents nothing more than an identity of historical belonging or location within society. Where interconnectivity within cohorts is loose due to varying personal experiences, there are still notable trends of similar values and shared experiences between people within the same generation (Törőcsik, Szűcs, and Dániel Kehl, 2014). Organizing the population into these predetermined cohorts allows for a more in-depth understanding of a collective current place in life as well as a method of tracking changes in perceptions through time (Dimock, 2019). Researching that collective place in which each separate generation resides gives a more in-depth view of what drives them. Once that is established for each generation it results in a better understanding of how to reach all areas of society. Generations are usually attached to a major crisis or turning point in society, such as the Vietnam War for Boomers, fear of nuclear war with Russia for Gen X, September 11, 2001, for Millennials, and the COVID-19 pandemic for Generation Z. Events like these unite individuals affected and shape the collective worldview of people born during a certain period of time (Twenge, 2023). Generational cohorts are often used to document such differences in attitudes and perceptions. Harari, Sela, and Bareket-Bojmel (2023) discussed the variation in reactions

between Generation Z and Generation X when coping with COVID-19. They assessed the different values seen in each generation and how they dealt with this worldwide crisis.

2.5.1 Baby Boomers and Generation X

After World War II and the Great Depression, America experienced a new sense of confidence and security, which resulted in an increase in births (Rafferty, 2017). This became the Baby Boomer generation, which consists of individuals born between 1946 and 1964 (PEW Research Center, 2019). Unlike the generations before them who were raised with a focus on purely surviving the world events around them, Baby Boomers grew up with a sense of stability and prosperity that their parents had never seen before. This allowed them to take an active stance regarding societal change and human perception of that change (Mills and Cannon, 1989). As the name suggests, this generation was characterized by larger families, which fostered population growth, economic development, and suburbanization across the United States. Boomers, however, did not center their lifestyle around what is traditionally seen as a banal cultural void: the stereotypical suburbia (Monhollon, 2010: Fingerman et al., 2012: Harris, 2018). Instead, they advocated for better access to education across all demographics and for a change in societal norms and values. They are particularly known for their influence on major national discussions and historic events such as women's rights, the Vietnam War, and the Civil Rights Movement (Monhollon, 2010: Conwell and Quadlin, 2022). Another push against the bland suburban lifestyle was accomplished as they heavily shaped American culture through music and dress, making what used to be provocative become socially acceptable (Rafferty, 2017: Christian, 2011).

Generation X consists of individuals born between 1965 and 1980 (PEW Research Center, 2019). They are often overlooked because they fall in the middle of Baby Boomers and Millennials, which are both larger segments of the population and more heavily researched (McKenna, 2021). The majority of what influenced Generation X came as the outgrowth of Baby Boomer lifestyles. With the Baby Boomers in the workforce, educated, and validating nonconformist views, Generation X became known as latchkey kids who had to navigate high divorce rates of their parents, the AIDS epidemic, the War on Drugs, and the Cold War (McKenna, 2021: Ortner, 1998) Generation X reacted to these events in multiple different ways. They complained that it was unfair that they were responsible for repairing what the Baby Boomers had left them, and later they began helicopter parenting as a way of overcompensating for their own childhood. These responses gave Generation X a negative connotation, but further research claims that the events they dealt with led them to grow up independent, self-assured, and self-sufficient. This allowed for conversations promoting work-life balance and the concept of changing jobs more frequently than in previous generations (Reisenwitz and Iyer, 2009: McKenna, 2021). This independent ideology was set to the soundtrack of hip-hop and grunge rock music, further propelling the notion of Generation X as the angst-ridden and forgotten "middle child" (Christian, 2011: McKenna, 2021).

2.5.2 Millennials and Generation Z

Echo Boomers, Generation Y, and Generation Tech are all names that refer to the generation most commonly referred to as Millennials, who were born between 1981 and 1996 (PEW Research Center, 2019: Howe and Strauss, 2000). Millennials rival the Baby Boomers as one of the most heavily studied and demographically represented cohorts

alive today (Fry, 2016: Alsop, 2008). Similar to the Baby Boomers, they grew up in a time of economic prosperity with a newfound sense of security that coincided with the end of the Cold War (Howe and Strauss, 2000). Throughout the early to mid-2000s, however, Millennials faced unexpected major events such as 9/11, long wars in Iraq and Afghanistan, Hurricane Katrina, and entry into the workforce during the Great Recession, all of which altered the preconceived view of certain and steady comfort (Alsop, 2008: Dimock, 2019: Zelazko, 2024). Even with that, Millennials still stray from the pessimism of Generation X and are seen as optimistic, having solid morals, valuing education, caring about social responsibility, and wanting to engage in meaningful and challenging work in their careers (Rainer and Rainer, 2011: Fry, 2016: Behrstock-Sherratt and Coggshall, 2010: Eddy, Schweitzer, and Lyons, 2010). Millennials grew up alongside accelerated advancements in technology, gathering a lot of backlash from earlier generations who claim that Millennials are lazy and entitled. Recent research, however, has shown them to be team players and accept authority (Alsop, 2008: PEW Research Center, 2019: Howe and Strauss, 2000). Being a large generation, Millennials are diverse, but overall, they have collectively influenced society to promote self-worth as well as social, economic, and cultural progress (Howe and Strauss, 2000: Alsop, 2008)

Those born between 1997 and 2012 are members of Generation Z (PEW Research Center, 2019). They grew up completely immersed in technological advancements and constantly exposed to social media. Their familiarity with technology has created a larger gap in skills, relative to those shown by past generations, such as work habits and critical thinking (Tulgan, 2013). Generation Z's consumer tendencies continue to show this reliance on technology as they are dictated by innovation, convenience, security, and

escapism. Growing up during a time characterized by accelerated technological advancements, Generation Z regularly expects rapid diffusion of information and seeks what is newer, smaller, and better (Wood, 2013: Nguyen and Patel, 2023). This intense tie to technology has also shaped this generation's need for human connection (Tulgan, 2013). This connection was utterly lost during the COVID-19 pandemic, impacting Generation Z's mental health and educational environment (Ang et al., 2022). This generation is now entering the workforce, unsure of their long-term goals and disillusioned by short-term prospects (Tulgan, 2013).

2.5.3 Climate Perceptions Among Generations

Given that Generation Z and Millennials were raised with technology at the forefront of their youth, it is no surprise that they interact with climate change content on social media more frequently than the older generations (Thigpen and Tyson, 2021). Capoano, Balbé, and Costa (2024) further attach morality, in terms of MFT, to youth assessing reactions to environmental harm by analyzing comments on social media platforms such as Twitter. Even off screen, however, Millennials and Generation Z speak out about sustainability more than Generation X and the Baby Boomers as a whole (Brand, Rausch, and Brandel, 2022: Tyson, Kennedy, and Funk, 2021: Swim et al., 2022). Millennials have been linked to assuming personal responsibility for mitigating climate change and indicated a likelihood of choosing climate-friendly options (Skeirytė, Krikštolaitis, and Liobikienė, 2022). This interest in sustainability is displayed in their involvement with both the food sector and technological advancements. Notably, Millennials who are starting families are increasingly inclined toward pesticide and chemical-free food options (Bollani, Bonadonna, and Peira, 2019: Hanks et al., 2008:

Kamenidou, Stavrianea, and Bara, 2020). They are found to have an awareness of CO_2 as a problem, but many are uninformed on specific terms such as carbon footprint (Gallenti et al., 2019).

Generation Z is taking action by including information such as this within the education system, wanting to improve climate curriculum in schools (Walker, 2021: Brand, Rausch, and Brandel, 2022). Education is positively and significantly associated with climate change concerns, and those with higher education see more negative effects of climate change and are more concerned about it (Kight and Hao, 2022: Poortinga et al., 2019). Members of Generation Z tend to be heavily tech-savvy and community-oriented, and they understand why addressing climate change is important and beneficial (Su et al., 2019). With access to technology, Generation Z has had more information available to them at an earlier age than any generation before them, which might explain their early participation in societal debates in comparison to previous generations (Tulgan, 2013). This elevated maturity may also be explained through the need to rapidly respond to the climate crisis. Organizations such as The United Nations Children's Fund (2008) have come out and claimed that the future of sustainable development is reliant on the younger generations' ability to adapt to the already disastrous impacts of climate change. Walker (2021) adds an additional defining feature of Generation Z, climate anxiety. This not only shows the psychological impact climate change has already inflicted on Generation Z, but also the recognition by this generation that they will ultimately be responsible for climate mitigation.

The Principal Component Analysis (PCA) I ran in Fall of 2022 (Figure 1.2) displays a negative correlation between belief in climate change and citizens who are 65

and older, Baby Boomers. The PCA showed a positive correlation between climate change belief and those 20 – 29 years old, which includes both Millennials and Generation Z. That sparked the question of whether generations truly displayed differences in climate change perceptions, and if so, how. Answering these questions using a combined understanding of the PCA, past research, and the analyses seen in this thesis allows for a greater understanding of using *generations* as an important avenue for continued research on mitigation methods.

CHAPTER III – METHODS & ANALYSIS

This thesis research is a case study of climate change perceptions in a public higher education institution in the American Southeast. It aims to assess perceptions of climate change among students, staff, and faculty at the university by documenting belief in global warming, evaluating risk perception, prioritizing moral foundations, and recording generational differences. I used the following methods to communicate with the University of Southern Mississippi (USM), survey students, faculty, and staff, and complete an analysis to answer my four research questions.

3.1 Survey Instrument

This project heavily relied on human research for data collection, thus I sought approval from the Institutional Review Board (IRB) before I gathered any data. As part of the IRB approval process, I developed a survey instrument on Qualtrics, a web-based platform used to distribute surveys and generate reports. The opening page of the survey included two filter items. The first verified if the one taking the survey was eighteen years of age or older. If they were under the age of eighteen, they were unable to move forward with the survey. The second filter item was a consent form in which respondents had the option to click "Yes, I consent to participate" or close their browser and not complete the survey. The questionnaire followed these filter items.

The questionnaire consisted of three sections, which I chose to display in Qualtrics as five blocks. Blocks make no difference in the aesthetic display of the survey, but they allowed me to break up the instrument into more manageable parts. The first section contains seven items designed to measure belief in climate change and reactions toward environmental risk. The first six items in the survey were taken from *Climate*

Change in the American Mind, September 2021. All facets of the first section (Questions 1–7), pertain to Research Question One. These items measure climate perceptions such as belief, risk, and accountability. I separated Questions 6 and 7 into the second block of the questionnaire because of their uniform response scales.

I created the survey instrument in the Spring of 2023, and as such, it reflects *Climate Change in the American Mind, September 2021*. It is important to mention that YPCCC released updated research in January of 2024, but given the timing of my research I was not able to incorporate it into my survey instrument (Leiserowitz et al., 2023).

The second section of the questionnaire featured the published 20-item Moral Foundations Questionnaire (Graham et al., 2008). MFQ20 is a shortened adaptation of the 30-item Moral Foundations Questionnaire. These are both publicly available questionnaires intended for personal and educational uses. MFQ20 consists of four items per foundation as well as two separate items that are not scored; Questions 13 and 24 are only included to ascertain invalid survey responses (Graham et al., 2008). I embedded MFQ20 into this research survey as Questions 8–29 and scored them using a 6-point Likert scale, with 1 portraying the lowest correlation to the moral foundation the item was attached to and 6 being the highest. The third block in my questionnaire consists of Questions 8–18. I used these items to document each foundation by classifying the respondent's moral relevance concerning individual ethical situations (Graham et al., 2011). I measured levels of agreement with more specific and contextualized moral judgment statements with the third section, Questions 19–29 (Graham et al., 2011). Using

the data gathered from Question 8–29, I scored and further associated the five moral foundations to belief in climate change, providing a response to Research Question Two.

I included the fourth and final section of the questionnaire, Questions 30–39, to measure demographics. Questions 30–32 inquired about the respondents' locations, both where they currently reside and where they were born. I utilized the pre-coded question under the state category in the demographics section of the Qualtrics library for Question 30. Question 31 was originally a qualitative question in which the respondents could type in the state and county in which they currently reside. However, after I released a test survey and "county" was misread as "country" for the majority of responses, I adjusted Questions 31 to a drop-down format, with an added .CSV file that contained a list of every state and their counties or parishes. I used these responses to answer Research Question Three. Question 33 was another question that required added coding in Qualtrics. I formatted this item as a matrix table and included options from 1900 to 2049. I used these responses to determine the generation in which each survey member belongs, providing an answer to Research Question Four. The survey concluded with a message notifying the participants that they had finished. I obtained IRB approval on 5 April 2023. For a copy of the IRB approval letter see Appendix A.

I sent out the trial survey immediately following IRB approval, and administered it to family, friends, and two sections of an undergraduate earth sciences lab. These answers are not included as part of the final results and were only used to correct and improve the final survey's aesthetic, compilation, and build. A copy of the final questionnaire can be seen in Appendix B.

3.2 Survey Implementation

In order to receive a sample that spread across the American Southeast, I initially contacted twenty-eight universities. I reached out to the IRB offices of these institutions and requested their approval to survey their students, faculty, and staff. I notified each university that I had received IRB approval from USM and sent them a copy of my questionnaire. Some of my email requests received no reply. The few responses I obtained either automatically denied my request or put me in touch with another faculty or staff member at that university who would be better equipped to help distribute the survey. Further correspondence with these contacts only resulted in them stating that the university did not allow external researchers to send out mass emails to their student body. With these setbacks, I began to pivot my research and focus exclusively on the University of Southern Mississippi.

The goal of data collection for this research was to get the largest sample of students, faculty, and staff possible through purposeful sampling techniques. Survey implementation began with my consultation with the USM Mailout liaison for the College of Arts and Sciences. USM Mailout is a mass email sent each Wednesday by the university to every student, faculty, and staff member. I opened the survey the same day it first appeared in USM Mailout, 8 November 2023. It continued to appear in two subsequent issues. To gain further responses, I continued reaching out to individual faculty members who were currently instructing sections containing large amounts of undergraduate and graduate students. Once informed of my project and research goals, these professors were given a link to the survey, and they presented the questionnaire to students enrolled in their courses. Some administered extra credit as an incentive, and

others simply posted it to Canvas, the digital platform used by USM for online learning management and course organization. I focused on obtaining responses from those primary distribution methods, but I also relied upon convenience sampling among areas of the university community that I was familiar with, which included classmates and peers in previous fraternity and sorority organizations.

To provide a valid answer to Research Questions One and Three, the population of this study had to remain similar to that of the one done by the YPCCC. The desired population for this survey consisted of all students, faculty, and staff within higher education institutions throughout the southeastern United States. I had to alter the population parameters after accepting the initial barrier of multiple institutions no longer being an option. The final population includes all students, faculty, and staff at the University of Southern Mississippi. In order to reach this population, the survey sample included each of these individuals. A complete sample frame, which would include a list of every single member of my population, could not be determined due to confidentiality; however, USM provided assurance that the survey would reach the sample desired through the internal email distribution. To meet the criteria determined to fit into the sample, respondents were recipients of USM Mailout. My survey was open for almost three months. After a favorable number of responses were recorded in Qualtrics, I closed the survey to any further responses on 5 February 2024 and began running initial descriptive statistics.

3.3 Analyzing Belief Perceptions

I began analysis by downloading the data from Qualtrics as a Microsoft Excel file, with each response pre-coded as an assigned number. I then continued to open new sheets

for Questions 1–7, containing a table with the total number of responses for each answer choice. From there, I made histograms displaying the distributions of answers for each question. The same was done for Questions 35–41, displaying distributions within the demographic items. I continued by transcribing the data as percentages. Initially, I included a fifth research question corresponding to the perception of risk within the sample. After I received such a high percentage of belief within the community, I decided to combine risk perception and belief into one comprehensive research question. This allowed for a more in-depth view of the subject. I began making PivotTables comparing the sample's answers to Questions 1–7 and then produced 2-D clustered bar charts to visually display the data. To fully answer Research Question 1, I took these data and descriptive statistics and compared the responses to those stated by YPCCC.

3.4 Correlating Morality to Climate Change Perceptions

Analysis for Research Question Two began when I calculated the distribution for each moral foundation using the MFQ20 SPSS syntax file found in Appendix C. I adjusted the equations to represent where the data was in my Microsoft Excel file, inputting the column as the question associated with the foundation. The adjusted equations can be found in Appendix D. I ran all statistical analysis in RStudio and began by completing a Shapiro-Wilks Test on each moral foundation to assess for normal distribution. All five foundations were not normally distributed, so I used nonparametric tests for my analysis. To complete a Kruskal-Wallis Test (K-W), I ranked each value for moral foundations in Microsoft Excel, and then downloaded the values in a .CSV file to run in RStudio. Answers to Questions 1–7 were run as individual tests displaying p-values for each moral foundation under each question. To evaluate the significance of

each answer group, the final test run on the data was a Wilcoxon Matched-pairs Signed-rank Test. I first ran this test on each moral foundation, comparing it with the individual answer choices for Questions 1–7; however, the Wilcoxon has an automatic adjustment in place, which showed a p-value = 1 for multiple different correlations. I managed this by implementing "p.adj = 'none'" into each line of code. This was possible because the one hypothesis I was testing was whether there was a significant difference between the groups. I then displayed the data in multiple tables using Microsoft Excel. I also used RStudio to code individual boxplots for each question and moral foundation combination. The median of each boxplot was found through RStudio as well. To fully answer Research Question Two, I analyzed the data and compared each moral foundation regarding the respondents' perception of climate change.

3.5 Geographically Distributing Climate Perceptions

The initial intention for Research Question Three was to produce another Local Moran on the data that I collected through this survey to assess and compare the two, but I did not receive enough data to complete a spatial autocorrelation.

I began to adjust my focus away from the Local Moran test and assess how my data was distributed geographically. First, I downloaded the response data of Question 31 from Qualtrics into Microsoft Excel and grouped the respondents into the county/parish they identified as where the currently lived. I ran PivotTables on Questions 1–7 to assess their perceptions of global warming, then downloaded the results as .CSV files and added them to ArcGIS Pro 3.X. After joining each of these files to a generalized county file that ArcGIS provided, I changed the symbology to display the data for Questions 1–7 using

graduated colors. I was still lacking enough data to properly analyze any differences in the survey responses.

I once again altered my approach and replaced all my county data from Question 31 with the data I received from Question 30. This data shows the responses indicating which state the participant was born. Using the same methods as I did for the county data, I took the adjusted state data, downloaded .CSV, and input it into ArcGIS. I then joined these data with a generalized state file provided by ArcGIS and began analyzing the generated maps. The last improvement I implemented was going back into the original .CSV files that held the answers grouped by state, and amalgamated the answer choices to replicate what was done by YCOM. I added those files back to the ArcGIS program, joined them with a generalized state map, and adjusted the symbology to display a graduated scale for answers to Questions 1–7. These end results provided sufficient data for me to generally compare the perceptions of climate change in the Southeast United States to what YCOM's data displayed.

3.6 Assessing Climate Perceptions Across Generations

I began the analysis for Research Question Four by downloading the data corresponding to Question 34, in which the participants indicated the year they were born. I then used Microsoft Excel to group the years into generations. Since generations are a social construct and do not have universally agreed-upon beginning and end years separating each cohort, I used the years determined by the Pew Research Center. I assigned everyone who answered 1946–1964 to the Baby Boomer generation, everyone who answered 1965–1980 to Generation X, those who answered 1981–1996 were Millennials, and the rest born from 1997–2005 were assigned Generation Z. According to

the Pew Research Center Generation Z extends until 2012, but since my survey did not include anyone under the age of eighteen, the latest year the respondent could have been born in was 2005 (PEW Research Center, 2019). After I sorted each member into a generation, I continued in Microsoft Excel, creating PivotTables that compared each of these generations' answers to Questions 1–7. I transcribed the gathered data as percentages and used these to compare each generation's perceptions on global warming. I then used RStudio to display this data as histograms. Lastly, I stayed in RStudio to assess differences in each generation's relationship to the moral foundations by running multiple Wilcoxon Tests to compare each generation's answers to the questions pertaining to MFT.

CHAPTER IV – RESULTS

4.1 Demographic data

When my survey closed on 5 February 2024, Qualtrics reported a total of 289 responses. Women submitted the majority of the returned surveys, making up 65.9% of the sample, while men make up 30.6%, and 2.2% identify as non-binary. Those that chose the answer option of "other" make up 1.3% of the sample population. The highest-represented racial and ethnic backgrounds were European Americans, making up 78.5% of the respondents, and following that, African Americans at 12.8%. I categorized social class on a scale ranging from lower to upper, with five different choices. The lowest socioeconomic class made up 7.7% of the sample, 23.2% chose the lower-middle class, 52.7% selected the middle class, and 15.8% related to the upper-middle class. Only one respondent identified themselves as upper class. The survey was open to students, faculty, and staff. Some 63.5% identified as students, 17.2% as faculty, and 19.3% as staff members. Within this educational context, it was relevant to ascertain the surveyed member's highest level of academic achievement. Some 16.8% of respondents declared that they have a high school diploma or the equivalent, 27.3% stated they have some college credit, but no degree, and 8.2% have obtained an associate degree. The next highest levels of educational attainment include 13.4% of respondents who had earned a bachelor's degree and 19.5% who had a master's degree. A total of 14.3% reported having a doctoral degree with one respondent claiming to have a terminal professional degree other than a Ph.D.

4.2 Perceptions of Climate Change at USM

Of the 289 responses, 232 were viable for analyzing Questions 1–7. The results for Question 1 are displayed in Figure 4.1 and show that a total of 87.5% of the sample believe that global warming is happening. The remaining population is almost evenly split, with 6.0% not believing it is happening and 6.5% not knowing whether or not it is happening.

Of those who do not believe climate change is happening, 42.9% were faculty, 28.6% were students, and another 28.6% were staff. Of the members who believe global warming is happening, 85.7% understand it is caused mainly by human activities. This percentage decreases to 75.4% when viewing the sample as a whole and not just those who believe in global warming. The next most agreed on cause was "natural changes in the environment" which 11.6% of the population chose. Following that, 3.4% answered "other," and 5.2% claim that they do not know what the leading cause of global warming is. When asked whether they have personally experienced the effects of global warming, 29.7% of the sample strongly agreed, 48.3% of respondents answered that they somewhat agree, and 12.1% somewhat disagree. This makes the uncertain categories the most relatable because the last answer choice, strongly disagree, was only chosen by 9.9% of the sample. Of those respondents, 21.7% believe that global warming is occurring.

The answers to Question 3 were submitted in a 4-point Likert scale format and display a positive correlation between belief in global warming and perceived worry (See Figure 4.2). Figure 4.2 shows that 39.7% of the sample answered that they were "very worried" about the impacts, and all of these respondents believe that global warming is happening.

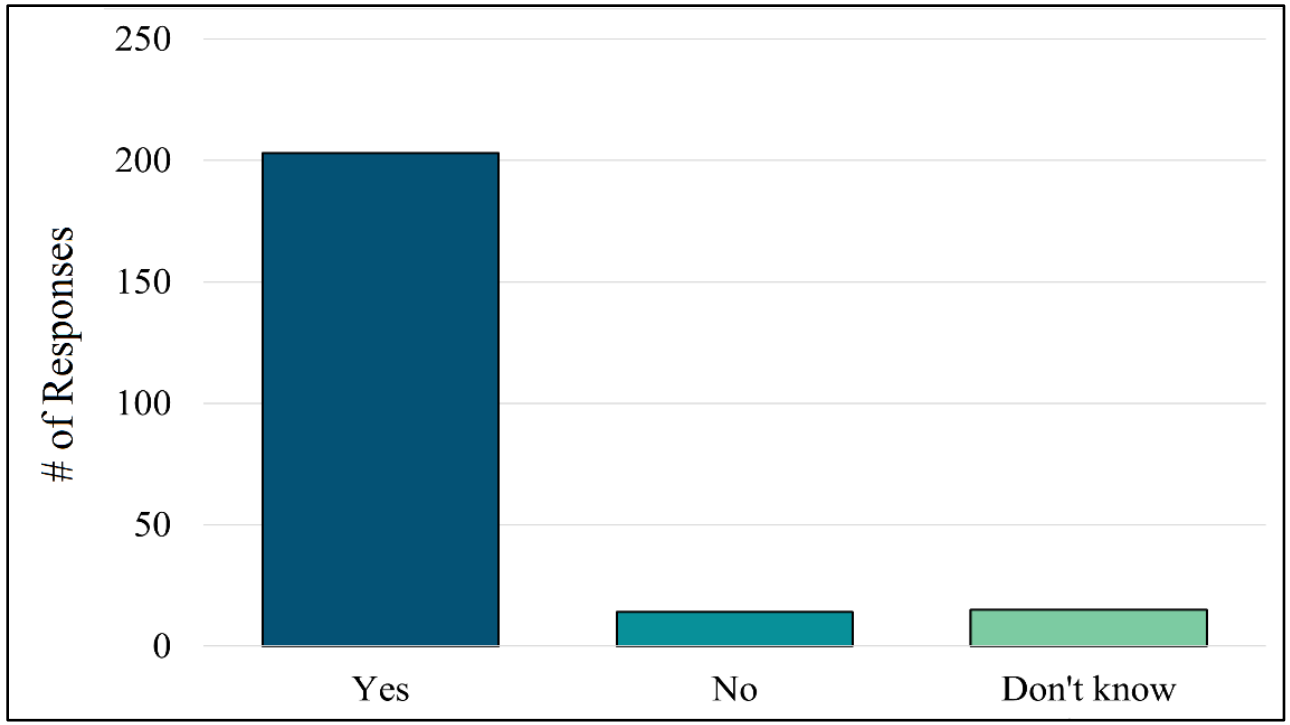

Figure 4.1 *Survey Responses on Belief that Global Warming is Happening*

Figure 4.1 displays a distribution of survey responses from Question 1 showing belief in climate change. The highest proportion of the population believes that climate change is happening, and the following answer choices only differed by 1 respondent.

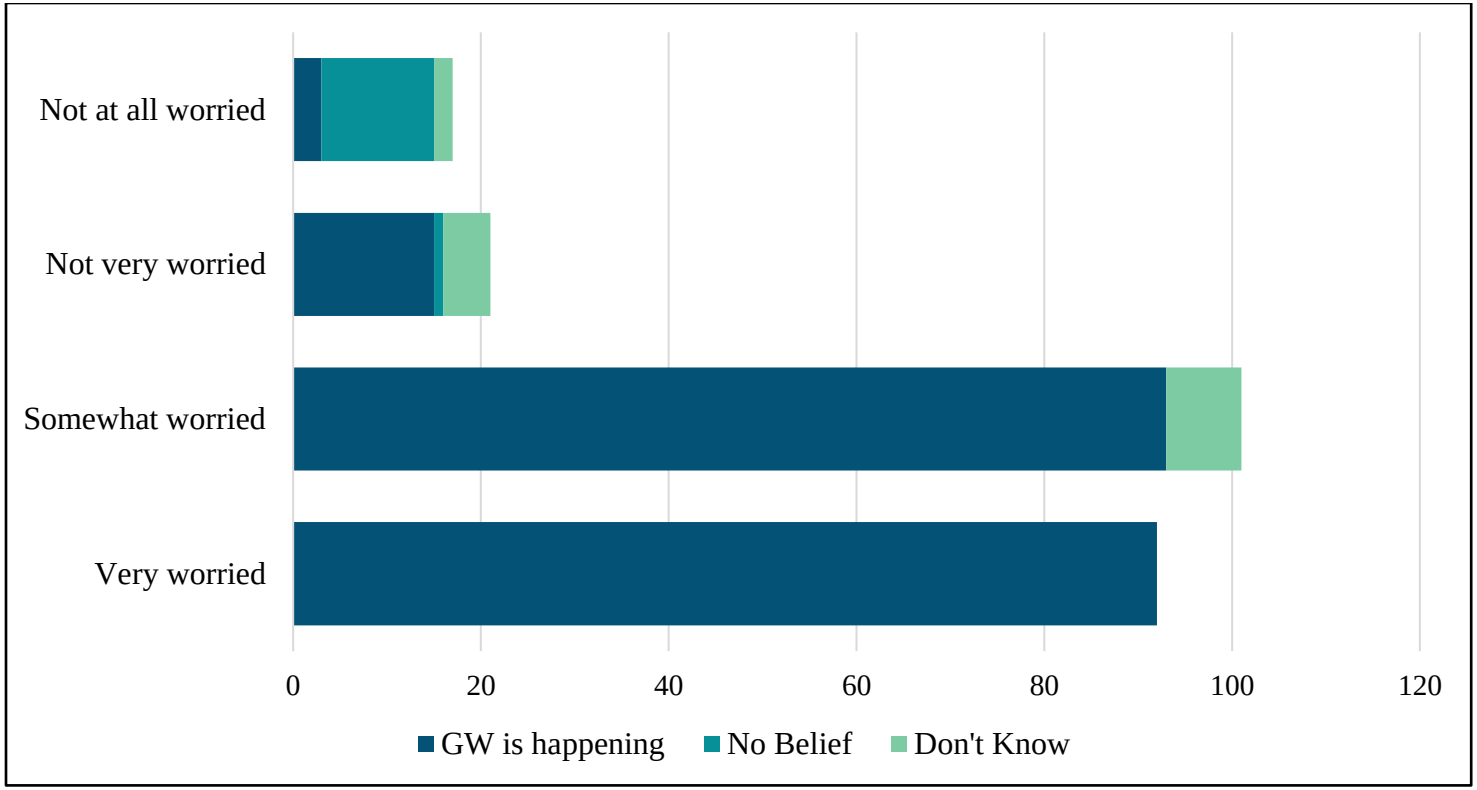

Figure 4.2 *Collective Analysis of Belief in Global Warming and Concern for the Impacts*

Figure 4.2 displays a distribution of survey responses from Question 1 and Question 3. Each bar shows the number of respondents in the designated level of worry, and then is further split by the amount of belief in climate change within that agreement on concern. The results indicate that there is a positive relationship between belief in global warming and perceived worry.

Figure 4.3 supplements further information displaying that 93.5% of the respondents who are very worried also believe that humans mainly cause global warming, and only 2.2% claim that it is due to natural environmental changes. Of the total responses, 43.5% relayed that they were "somewhat worried" about the situation, and only 7.9% of those people claimed that they were unsure if global warming was occurring. Within that same group that answered, "somewhat worried," 76.2% believe that the cause of climate change is humans, and 14.8% believe that the environment influences the changes. Only 9.1% of the total sample claimed that they were "not very worried" about the impacts of global warming; however, 4.7% of those respondents do not believe that global warming is happening, and 33.3% believe that it is mainly environmental factors influencing global warming. Lastly, 7.3% of the total sample selected the lowest level of worry. Of those individuals, 70.5% do not believe that global warming is happening, and 17.6% believe the leading cause has to do with natural changes in the environment.

The belief that global warming is occurring relates to the notion that it will continue to harm future generations (See Figure 4.4). A total of 58.1% of the sample claim that they believe global warming will harm future generations "a great deal," and all of those individuals believe global warming is happening. None fall under the category of both not believing in global warming and believing that it will harm future generations "a moderate amount." Of the 24.1% who aligned with that moderate viewpoint, 5.4% claimed they did not know whether global warming was happening. Those who chose "only a little" harm to future generations make up 6.5% of the entire sample, and one of those members does not believe that global warming is happening.

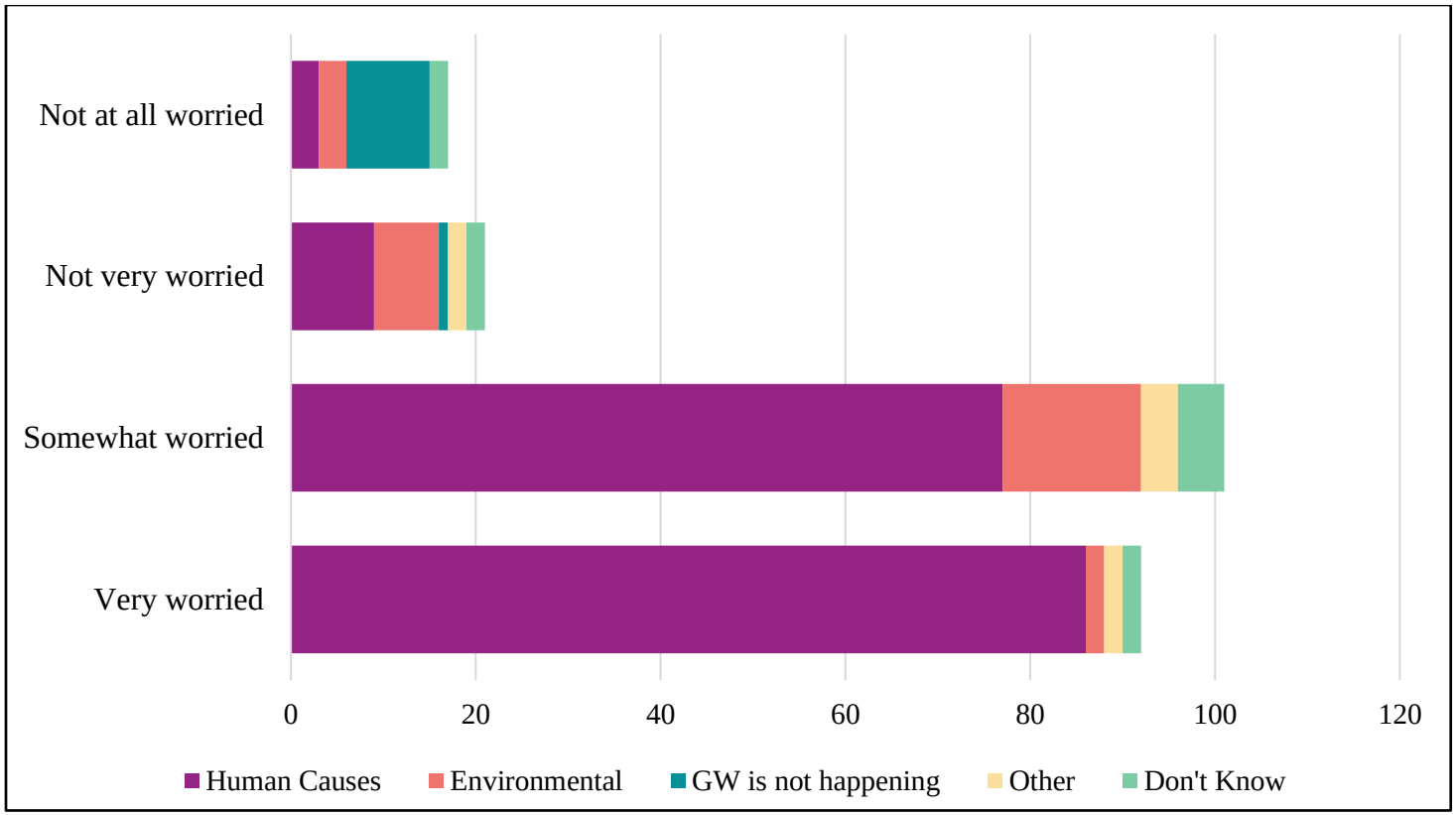

Figure 4.3 *Collective Analysis of Belief in Main Cause of Global Warming and Concern for the Impacts*

Figure 4.3 displays a distribution of survey responses from Question 2 and Question 3. Each bar shows the number of respondents in the designated level of worry, and then is further split by the which main cause the respondent associates with climate change.

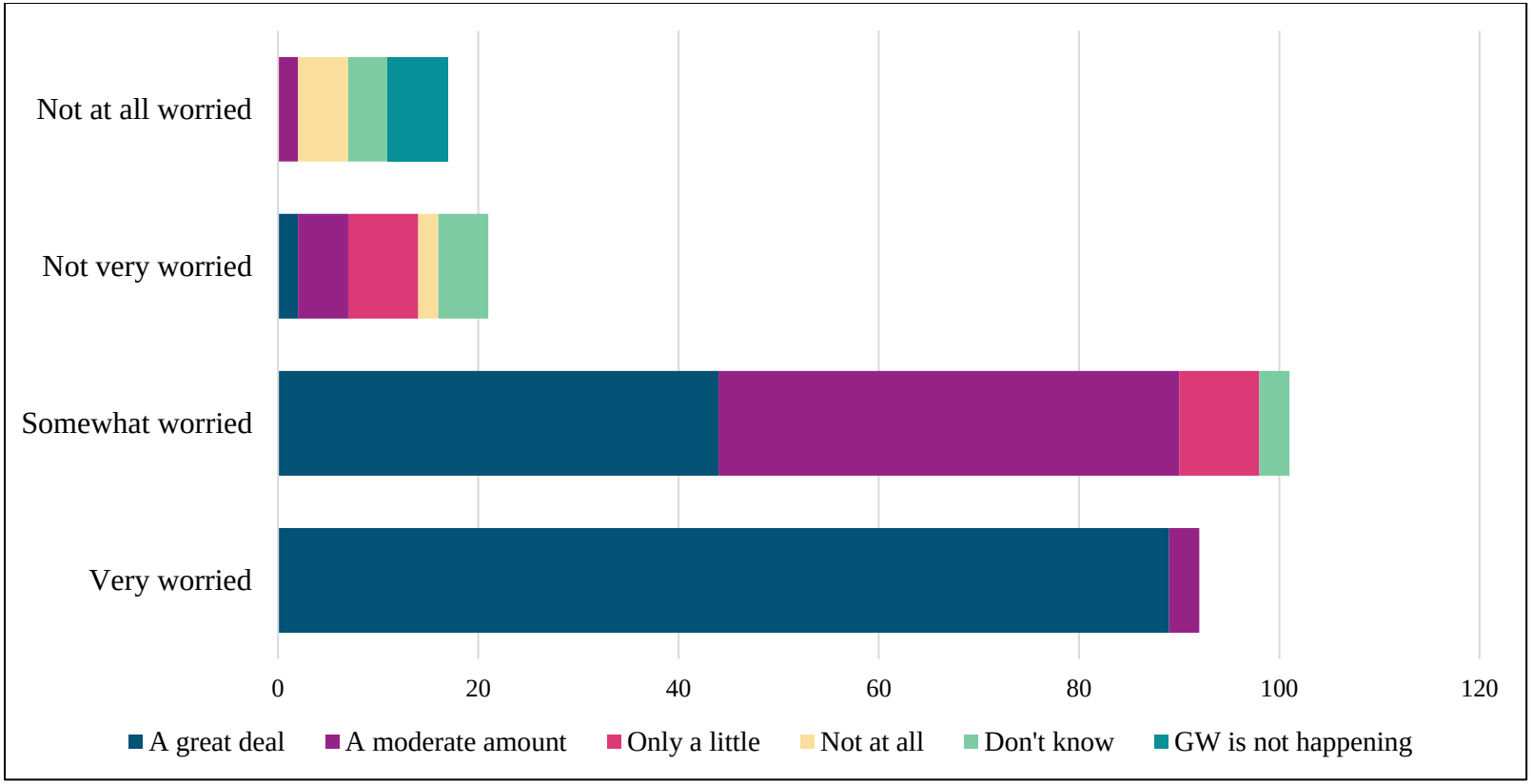

Figure 4.4 *Collective analysis of belief that global warming will harm future generations and concern for the impacts*

Figure 4.4 displays a distribution of survey responses from Question 3 and Question 4. Each bar shows combined agreement between the level of concern towards climate change as well as how much the respondents believe global warming will harm future generations. The subdivisions display that the more each respondent is currently worried about climate change the more the respondent believes it will affect future generations.

The lowest level of worry for future generations was chosen by 3.0% of the respondents, and the majority, 71.4%, of those people do not believe that global warming is occurring. Out of the 5.6% who do not know if global warming will harm future generations, 30.7% believe global warming is happening, 15.4% do not believe in its occurrence, and 53.8% do not know if global warming is happening. There was a separate answer choice of "global warming is not happening," to which only 2.6% of the entire sample agreed.

Those currently worried about global warming's impacts were also worried about its effects on future generations. Of those "very worried" about global warming's impacts, 96.7% believe it will harm future generations "a great deal." Only 43.6% of those who answered, "somewhat worried," chose the same response when asked about harm towards future generations, and 45.5% of them believe that global warming will only harm future generations a moderate amount. Continuing to look at those who answered, "somewhat worried," only 7.9% believe that it will only harm future generations a little, and 3.0% claim that they do not know how global warming will affect the future. The results show that 9.5% of those who claim they are not very worried about global warming still agree that global warming will harm future generations "a great deal," and another 9.5% of those believe that global warming will not harm future generations at all. Continuing with those who are "not very worried" about the impacts of global warming, the highest response, 33.3% believe that global warming will harm future generations "only a little," 23.8% answered "a moderate amount," and another 23.8% answered "don't know." The remaining members were evenly distributed among those who feel global warming will harm future generations "a great deal," 9.5% and those who think it will not harm future generations at all, 9.5%. Of those who are not at

all worried about the impacts of global warming, 35.3% do not believe it is happening, 29.4% do not believe that it will harm future generations, 23.5% do not know whether they believe global warming is happening, and 11.7% believe it will harm future generations a moderate amount.

Of the total sample, 13.4% believe that global warming will personally harm them a great deal, and 96.7% of these responses came from those who believe global warming is happening. Those that believe global warming will harm them a "moderate amount," make up 44.8% of the total sample, with only one of those participants answering "don't know" to belief and the rest stating that they believe global warming is happening. Figure 4.5 displays the combined views of those who believe global warming will harm them personally, and the level of worry they have towards the situation. Of the people who believe that global warming will harm them a moderate amount, 52.8% are very worried about the impacts, and the remaining 47.1% claim they were only somewhat worried. "Only a little" was chosen by 22.8% of the sample when asked how they believe global warming will harm them, with 92.5% of this group agreeing that global warming is happening and the other 7.5% not knowing if it is or not. Of those same individuals who believe global warming will harm them only a little, 15.1% also claim that they are "very worried" about the impacts of climate change, 73.5% of them are only "somewhat worried," 9.4% are "not very worried," and 1.9% are not at all worried. Those who believe global warming will not harm them at all make up 9.5% of the sample. Of those members, 50.0% do not believe it will harm them still believe global warming is happening, 31.8% do not believe it is happening, and 18.2% do not know if it is happening or not. Out of those who do not believe it will harm them, 9.5% claim that

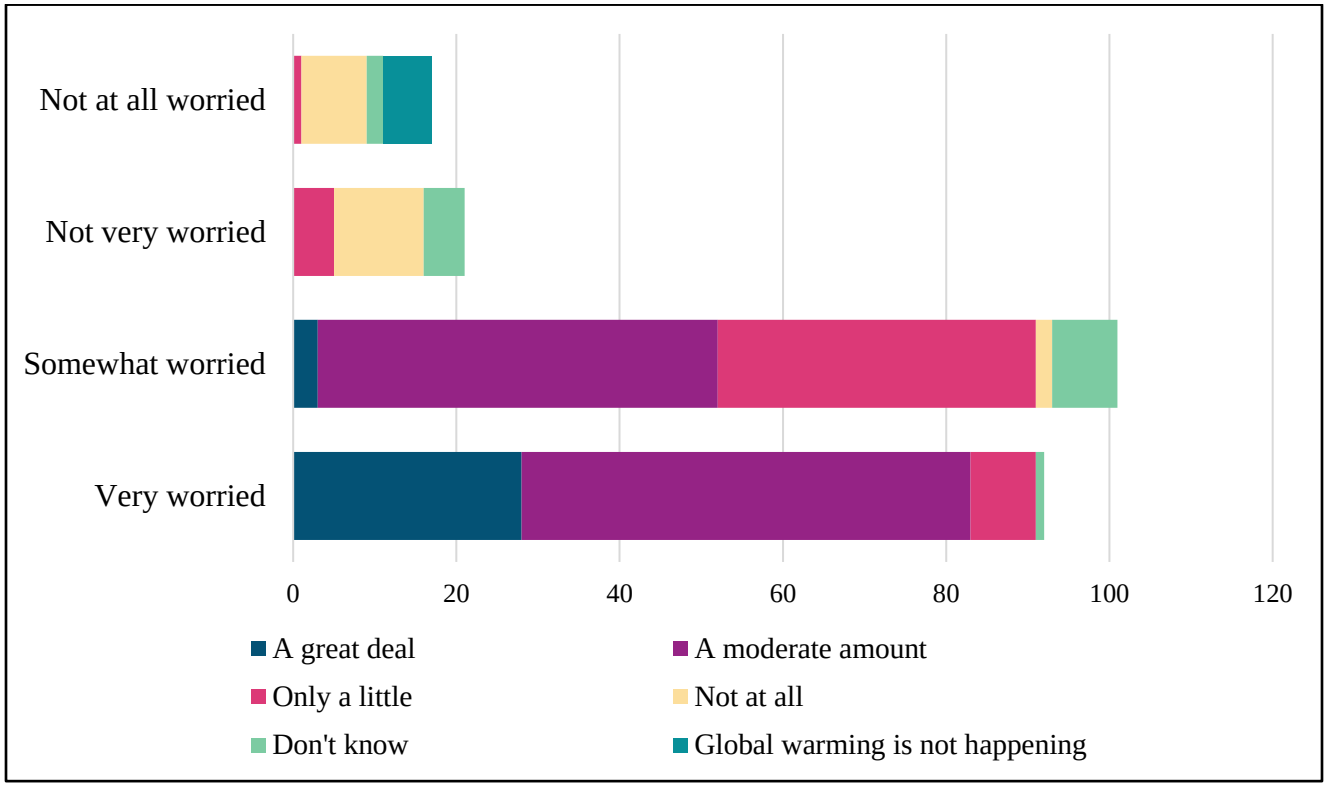

Figure 4.5 *Collective analysis of belief that global warming will personally harm the respondents and concern for the impacts*

Figure 4.5 displays a distribution of survey responses from Question 3 and Question 5. Each bar shows combined agreement between the level of concern towards climate change as well as how much the respondents believe global warming will harm them personally.

they are somewhat worried about the impacts global warming will have, 52.4% are not very worried, and 38.1% are not at all worried. While 6.9% of the participants do not know whether global warming will harm them, 62.5% of those members believe that global warming is happening, 6.3% do not believe it is, and 31.3% do not know. The people who answered, “don’t know” still hold a moderate sense of worry, as 6.3% are “very worried” about the impacts, 50.0% are “somewhat worried,” 31.3% are “not very worried,” and the last 12.5% are not at all worried.

When asked whether the participants agree or disagree with the statement “I feel a personal responsibility to do something about global warming,” 24.6% answered that they strongly agree. Of those respondents, 93.0% also agree that global warming will harm future generations a great deal (See Figure 4.6), 94.7% of them believe that it will personally harm them to some degree, and all of them expressed some level of worry about the situation. There is a higher agreement among members of the middle to lower classes, with 54.4% of those who feel this deep responsibility claiming they are members of the middle class and 26.3% lying within the lower-middle class. Those who only somewhat agree with whether they feel a responsibility to do something about global warming make up 52.2% of the entire sample. Of those members, 95.0% agree that it will harm future generations to some extent, 90.9% agree that it will harm them personally, and 90.1% are worried about the impacts. Those who disagree to any extent that they are responsible for doing something about global warming make up 23.7% of the entire sample population, and 61.8% of those people still agree that global warming will harm future generations; however, only 43.6% answered that it will harm them personally.

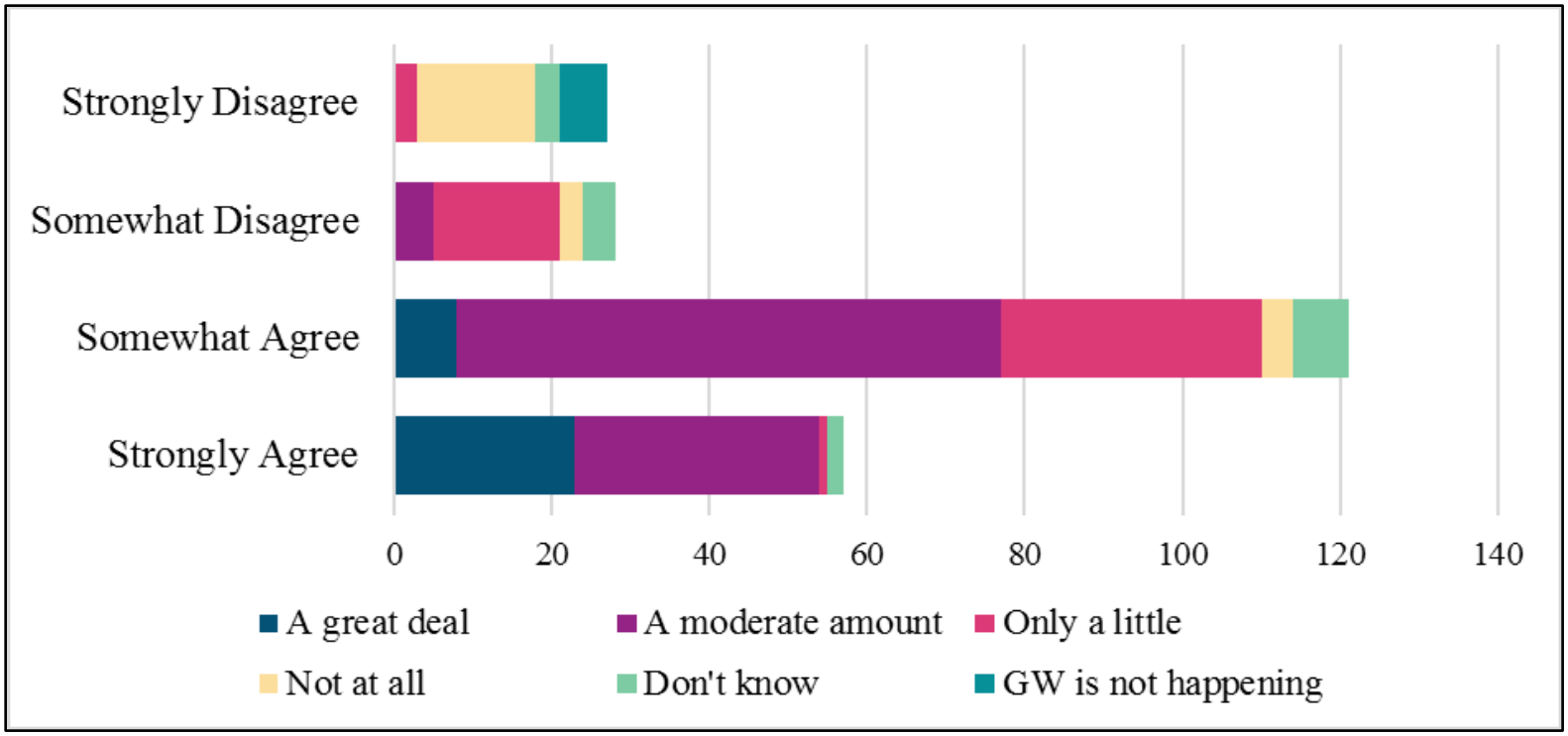

Figure 4.6 *Collective analysis of belief that global warming will harm future generations and the feeling of a personal responsibility to do something about it*

Figure 4.6 displays a distribution of survey responses from Questions 4 and 7. Each bar shows combined agreement between the respondent's claim to a responsibility to do something about climate change as well as their belief on how much it will harm future generations. The dual placement portrays promising information as a large portion of the population only believes it will harm future generations a moderate amount, or even the only a little, yet they still feel some level of responsibility to do something about the situation.

A certain level of worry is still expressed by 49.1% of those who, to any extent, disagree with the responsibility to do something about global warming. The distribution among social classes for those who disagree with responsibility is 9.1% lower class, 10.9% lower-middle class, 56.4% middle class, and 23.6% upper class.

4.3 Morality Within Climate Perceptions

While Qualtrics reported a total of 289 responses within the entire survey, only 233 respondents completely answered Questions 8 – 29. I used these valid responses when analyzing MFTs' impact on perceptions of climate change. The initial test, Shapiro-Wilks, shows that the distribution of each moral foundation departs significantly from normality with each p-value < 0.05 (Table 4.1).

Data for each of the following K-W can be found in Appendix E, and Wilcoxon Tests can be found in Appendix F. When a K-W was run comparing belief, all moral foundations showed a significant difference ($p < 0.05$). After running a Wilcoxon and setting aside the differences between agreement or disagreement in belief and those that do not know, however, the only two foundations with significant differences were Care and Fairness (See Figure 4.7). People who believe global warming is happening have a stronger affiliation with Care (median = 5), which is significantly different from people who do not believe in global warming (median = 3.75, p-value = 9.90E-05). The same is shown with those believing in climate change ranking high on agreement with the questions relating to Fairness (median = 5) being significantly different from those that do not believe in climate change (median = 3.625, p-value = 0.0006).

Table 4.1 *Shapiro-Wilks Test Results*

Shapiro-Wilks Test Results	
Moral Foundation	P-Value
Care	1.61E-09
Fairness	4.05E-11
Loyalty	1.171E-03
Authority	3.361E-04
Purity	2.823E-03

Table 4.1 lists each Moral Foundations p-value given by the Shapiro-Wilks Test. With each p-value < 0.05 none of them are normally distributed, and therefore, any further tests I ran had to be non-parametric.

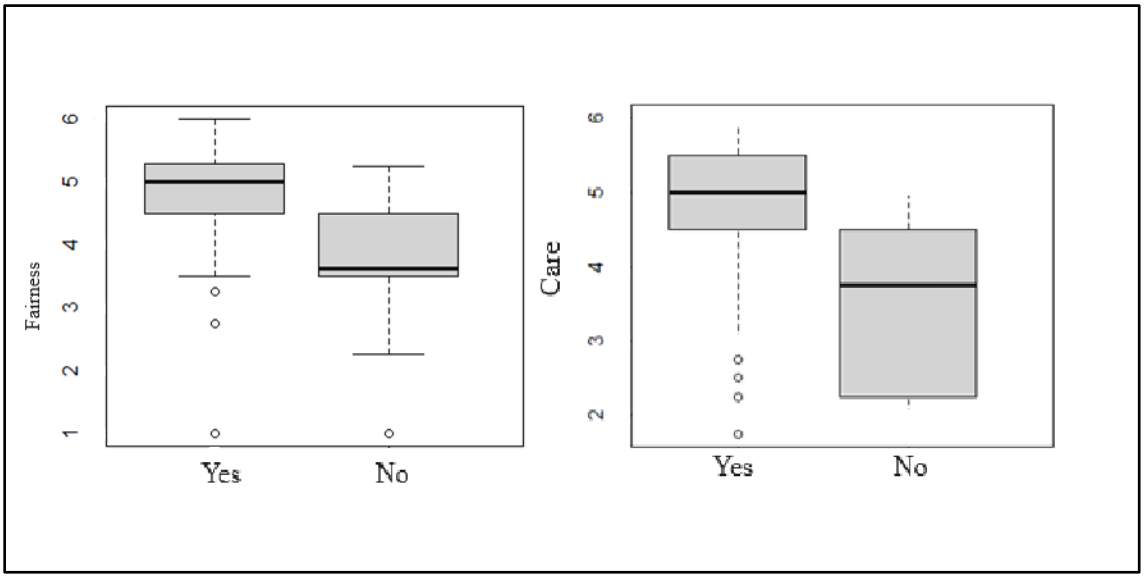

Figure 4.7 *Comparing Differences in Belief in Climate Change Regarding MFTs Care and Fairness*

Figure 4.7 visually represents the significant difference between belief and non-belief in climate change relating to both Care and Fairness. These were the only two moral foundations to significantly differ, and with "Yes" having a higher median of 5 for both moral foundations and "No" having a median of 3.75 for Care and 3.625 for Fairness, this figure shows the gap in belief as well as the relatively high moral stance for most quartiles.

After conducting a K-W to compare respondents' concerns regarding the impact of global warming, results indicated significant differences across all moral foundations ($p < 0.05$). When I ran a Wilcox, however, there was no trend between the amount of worry and how they rank in terms of Fairness ($p > 0.05$) except for when comparing the responses to "very worried" and "somewhat worried" to "not at all worried" ($p < 0.05$). The results reverse when looking at worry in comparison with Purity. There was a trend between the amount of worry and how they rank in Purity ($p < 0.05$) for all responses except for when comparing the results to "very worried" and "somewhat worried" to "not at all worried" ($p > 0.05$). When analyzing the results of the Wilcox for Care, Loyalty, and Authority, "very worried" was significantly different ($p < 0.05$) from all other answers (See Figures 4.8 and 4.9). Authority and Loyalty had no other significant differences in responses, but display that those in the sample who are "very worried" about the impacts of global warming have less of a connection to Authority (median = 3) and Loyalty (median = 2.75) which is significantly different from those who are "not at all worried" (authority median = 3.75, p-value = 0.005) (loyalty median = 3.25, p-value = 0.01342). Care relates to worry in the opposite manner, with a continuous trend displaying that the more one relates to Care, the more they are worried about the impacts of global warming. Those who are "very worried" have a median value of 5.25, and those who claim they are "somewhat worried" show a median of 4.75. It continues to decrease from there, with those who are "not very worried" having a median of 4.5, and lastly, those who are "not at all worried" have the lowest relationship to care with a median of 4.

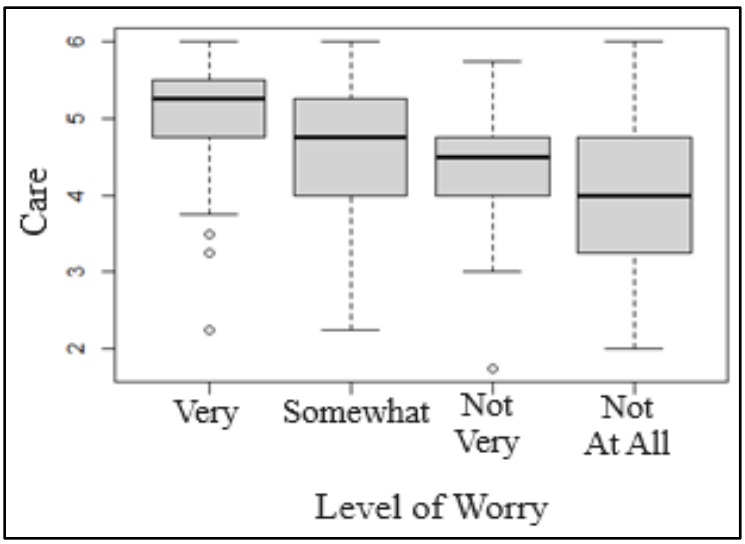

Figure 4.8 *The Relationship Between Care and Level of Worry*

Figure 4.8 displays a box plot I created in RStudio comparing one's correspondence with Care and their concern for the impacts of climate change. This shows a downward trend, as one who highly relates with care also agrees that they are worried about climate change. As their relationship to Care decreases, so does their amount of worry towards the situation.

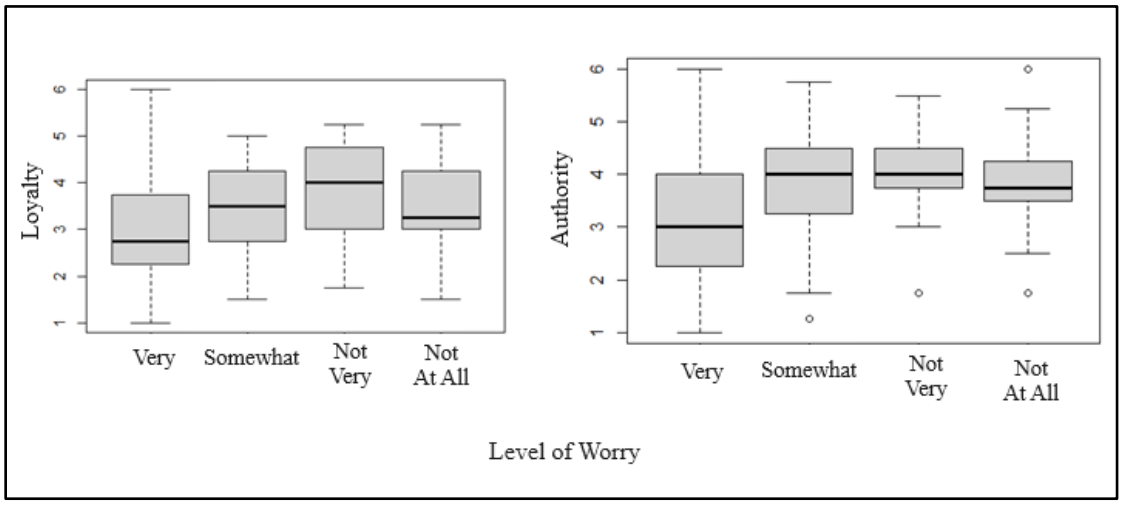

Figure 4.9 *The Relationships Between Authority, Loyalty, and Level of Worry*

Figure 4.9 displays box plots for both Loyalty and Authority's comparison to level of worry. They both display an increasing level of affiliation to the moral foundation until the lowest level of agreement towards worry.

The next K-W that compared the sample's agreement to belief that global warming will harm future generations revealed significant differences across all moral foundations ($p < 0.05$). The following K-W, correlating the answers to believing that global warming will harm them personally, showed significant differences for all except Fairness (p-value = 0.0747). When using a Wilcox and analyzing these two questions together, and their ranking on Care, there is a larger standard deviation (p-value 0.00101) between those that believe it will harm future generations "a great deal" and those that answered "not at all" than when comparing those same answer choices when asked whether or not they believe it will harm themselves (p-value = 0.01509). There are similar results in this concept within the context of Fairness. Since Fairness was the only moral foundation to not have a significant difference in answers when the K-W test was run on belief that global warming would harm the participant, the Wilcox test provided an expected p-value of 0.074 between those who believed global warming will harm them "a great deal" and those that believe it will harm them "not at all." However, looking at the same Wilcox test run on the belief that global warming will harm future generations, people who believe it affects future generations "a great deal" have a stronger affiliation with Fairness (median = 5), which is significantly different from those who claimed it would not harm future generations at all (median = 3.5, p-value = 0.00053). This is an even larger standard deviation than that shown in Care. Relations to Authority and Purity increase as belief that global warming will harm the respondent decreases. This steady incline is shown with an increase in medians between belief that it will harm them "a great deal" (Authority median = 3.25, Purity median = 3.25) and the belief that it will not harm them at all (Authority median = 4.125, Purity median = 4.75).

These affiliations to Authority are significantly different (p-value = 0.00017) and with Purity (p-value = 0.0032); however, with both of these foundations, this trend is not as strong when asked whether or not global warming will harm future generations. There is no significant difference between those who believe it will not harm future generations and those who believe it will harm them "a great deal" (Authority p-value = 0.232, Purity p-value = 0.98116).

Although the K-W that compared the sample's agreement to whether they have experienced global warming conveyed significant differences across all moral foundations ($p < 0.05$), the Wilcox test run on Care and Fairness only displayed this when comparing "strongly disagree" to all other answers. Relationships to Authority, Loyalty, and Purity continue to increase as the respondents decrease in experience until the highest level of disagreement. People who "strongly disagree" when asked if they have experienced global warming have the same affiliation to Authority (median = 4) as those who only "somewhat disagree." The strongest measurement of disagreement is not significantly different from those who "somewhat disagree" (p-value = 0.67539) or even from those who "somewhat agree" (median = 3.75, p-value = 0.05129).

Relation to Purity and Loyalty both decrease when the respondents reach this level of disagreement. People who only "somewhat disagree" with having experienced climate change have a higher affiliation to Purity and Loyalty (median = 4) compared to those who "strongly disagree" (Purity median = 3.5) (Loyalty median = 3.25). Regarding Purity, those who answered, "strongly disagree" are not significantly different from those who answered, "strongly agree" (p-value = 0.068), but those who answered, "somewhat

disagree" are significantly different from those who answered, "strongly agree" (p-value = 0.006).

I used the final K-W to compare MFT to the answers of belief that the respondent has a personal responsibility to do something about climate change. This test showed significant differences ($p < 0.05$) in measurements of belief for each moral foundation except Purity (p-value = 0.1521). People who "strongly agree" to feeling a responsibility to do something about climate change are more affiliated with Care (median = 5.25), which is significantly different from those who "strongly disagree" with this notion (median = 4.25, p-value = 5.50E-06) (See Figure 4.10). This is a continuous trend as the median value of Care for those who "somewhat agree" is 5, and for those who "somewhat disagree" is 4.5.

Fairness follows a similar trend but with a smaller standard deviation (p-value = 0.0015), and Loyalty and Authority display the opposite trend. Those who "strongly disagree" with the idea that they have a responsibility to do something about global warming are connected more with Loyalty (median = 3.75) and Authority (median = 4), which is significantly different from those who "strongly agree" (Loyalty: median = 2.75, p-value = 0.0023) (Authority: median = 3.25, p-value = 0.0035).

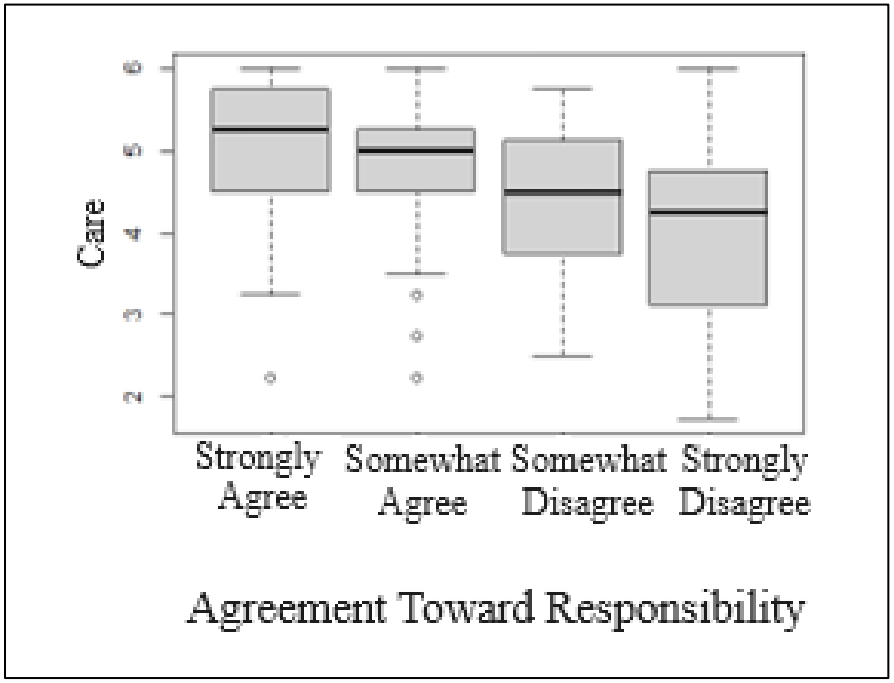

Figure 4.10 *The Relationship Between Care and Agreement on Responsibility*

Figure 4.10 displays a box plot I created in RStudio comparing one's correspondence with Care and their agreement on if they feel a responsibility to do something about the effects of global warming. It shows a downward trend, as one who highly relates with care also agrees that they have a responsibility to do something about climate change. As their relationship to Care decreases, so does their level of agreement on feeling responsible

4.4 Mapping Perceptions Throughout the Southeast

While Qualtrics reported a total of 289 responses, 225 of the respondents answered Question 30. None of the twelve maps created using these responses showed substantial cohesive agreement throughout the Southeastern United States on responses to Questions 1–7. When looking at those who answered "Yes" to whether they believe in climate change, the map portrays each state in the Southeast within a different class (See Figure 4.11).

There is the same dispersal of agreement when looking at whether the states' populations are worried about the impacts of global warming (See Figure 4.12). While the spread of perceptions is continuously different, their ranking on agreement varies in response to each item. Texas has the lowest percentage of its population claiming belief in climate change (0.667–0.75); however, when asked about their level of worry, they fell within the highest class (0.8589–1). Alabama fell within the second lowest class regarding both belief (.75–.81205) and level of worry (0.667–0.75). Louisiana ranked third in belief (0.8126–0.8182) and worry (0.7501–0.7727). While Florida has the fourth highest belief (0.8183–0.8333), their population has the lowest ranking when asked whether they were worried (0.5001–0.667). Mississippi had the second highest percentage regarding belief (0.8334–0.8824) and worry (0.8334–0.8588), and lastly, Georgia had the highest ranking of belief (0.8825–1.000) but only ranked fourth highest in worry (0.7728–0.8333).

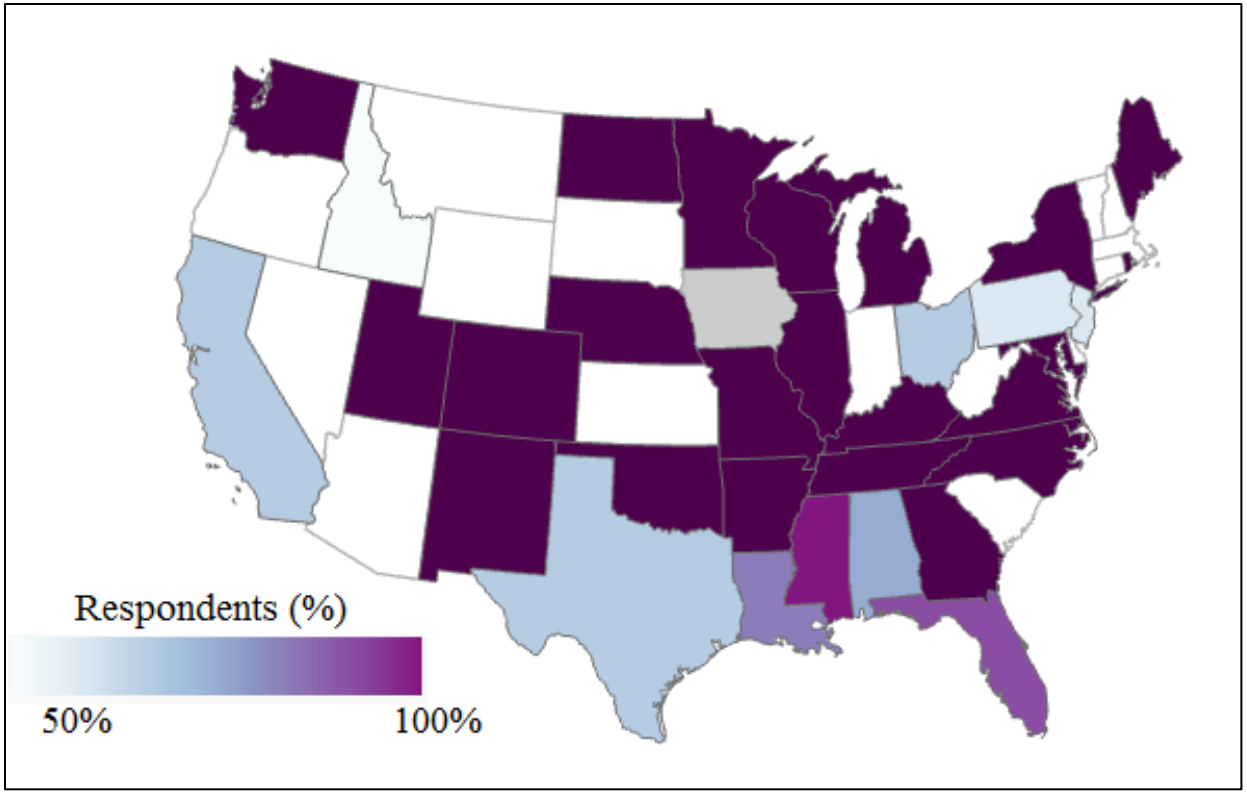

Figure 4.11 *Geographic Distribution of Climate Change Belief*

Figure 4.11 displays the percentage of respondents in each state that replied “Yes” to Question 1. The spatial distribution came from answers to Question 30, and therefore the states displayed are those the respondent claims they were born in. Specifically looking at those states in the Southeast is critical due to the lack of respondents present in the rest of the United States.

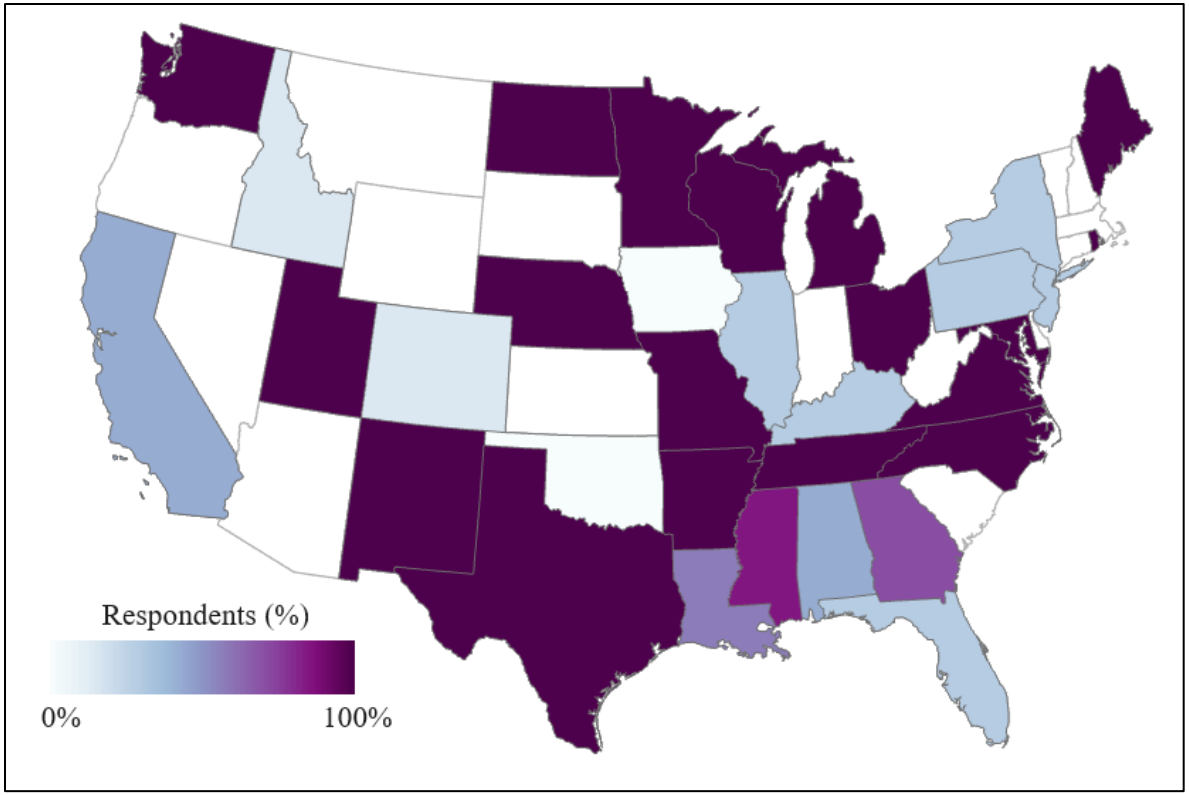

Figure 4.12 *Geographic Distribution of Worry Concerning the Impacts of Global Warming*

Figure 4.12 displays the percentage of respondents in each state that replied they were either “very worried” or “somewhat worried” to Question 2. The spatial distribution came from answers to Question 30, and therefore the states displayed are those the respondent claims they were born in. Specifically looking at those states in the Southeast is critical due to the lack of respondents present in the rest of the United States.

When discussing whether they had any personal experience with climate change, none of the southeastern states are in the highest class, and all except Texas and Alabama (0.7177–0.7500) show different agreements (See Figure 4.13). Those with the lowest percentage of respondents are in Florida (0.5001–0.6667), and Mississippi (0.6668–0.7176) is separated into the next class. The two states with the highest percentage of their population agreeing to have experienced climate change are Louisiana (0.7501–0.7727) and Georgia (0.7728–0.8571).

The map displaying the responses to Question 5 is separated into 10 classes and displays the largest amount of collective agreement between these southeastern states. Texas, Louisiana, and Florida all have a 33%–50% agreement that global warming will harm them personally. This is also the lowest class found within this region. Mississippi (0.5001–0.5059) follows these states, and Alabama contains the next highest (0.5060–0.5625). Georgia is four classes higher than Alabama, with 80%–86% of their population agreeing that global warming will harm them personally. Once again, none of the respondents that agree global warming will harm future generations fall within the highest class. Texas and Alabama hold the lowest acknowledgment (0.6668–0.7500), and Georgia and Florida are similar, with the highest acknowledgment (0.8236–0.8333). However, only 75%–77% of Louisiana and 80%–82% of Mississippi agreed.

Figure 4.14 displays the geographical dispersion of those who agree they are responsible for doing something about global warming. When separated into the highest number of classes possible, there were twelve options, and each state fell within a different one. Florida displayed the lowest percentage (0.3334–0.5000), followed by Louisiana (0.5001–0.6364). Alabama (0.6668–0.6875), Texas (0.6876–0.7500), and

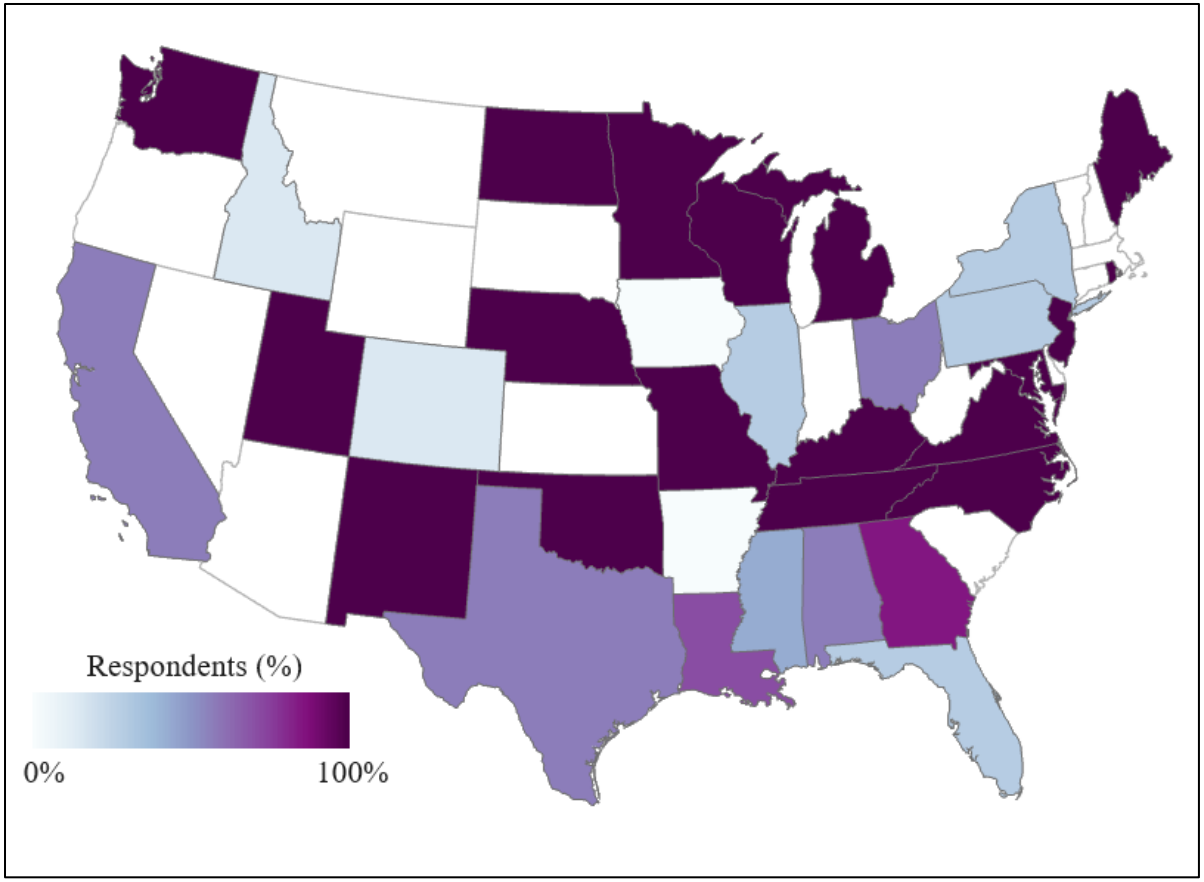

Figure 4.13 *Geographic Distribution of Respondents Who Agree to Having Experienced Global Warming*

Figure 4.11 displays the percentage of respondents in each state that replied “strongly agree” or “somewhat agree” to Question 6. The spatial distribution came from answers to Question 30, and therefore the states displayed are those the respondent claims they were born in. Specifically looking at those states in the Southeast is critical due to the lack of respondents present in the rest of the United States.

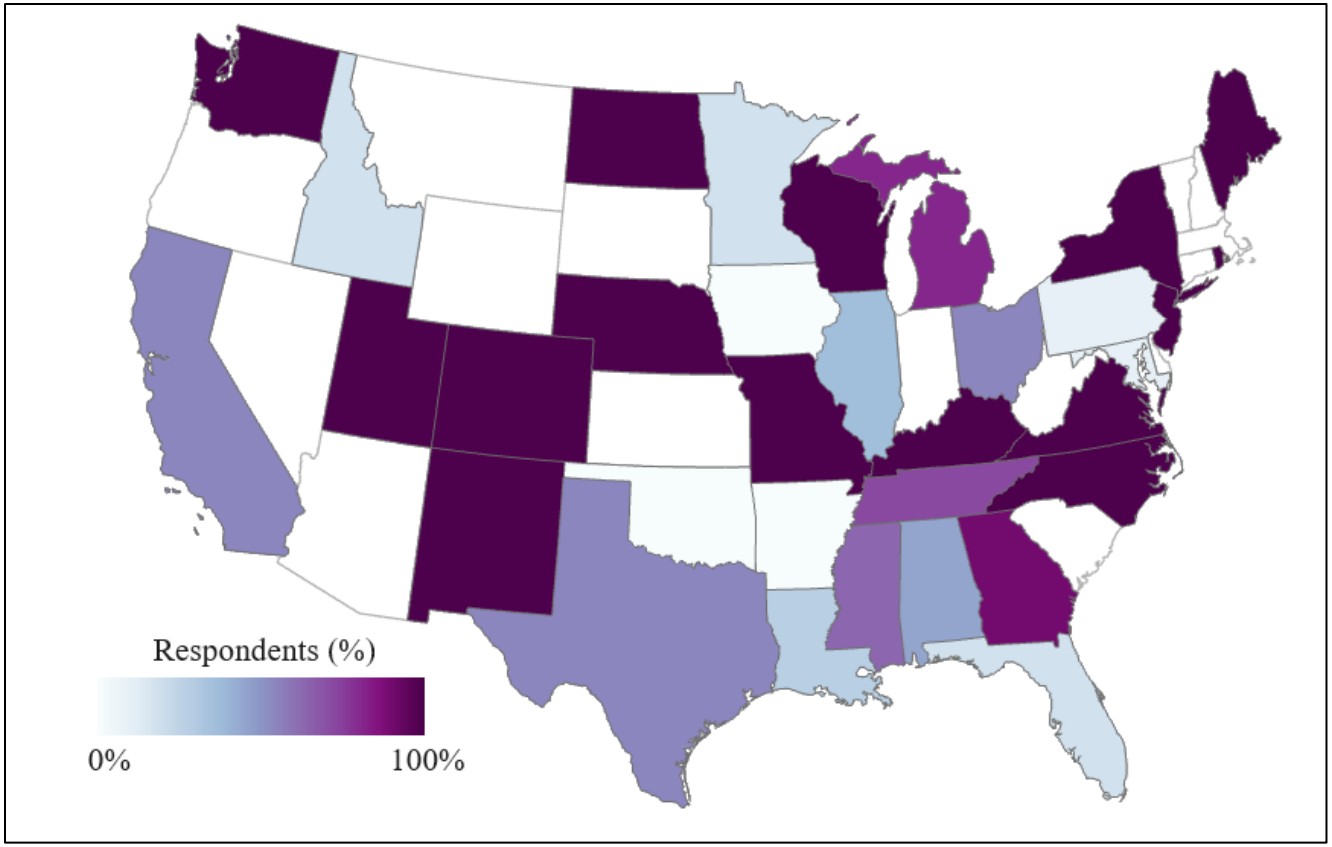

Figure 4.14 *Geographic Distribution of Respondents Who Agree They Are Responsible for Doing Something About Global Warming*

Figure 4.14 displays the percentage of respondents in each state that replied “strongly agree” or “somewhat agree” to Question 7. The spatial distribution came from answers to Question 30, and therefore the states displayed are those the respondent claims they were born in. Specifically looking at those states in the Southeast is critical due to the lack of respondents present in the rest of the United States.

Mississippi (0.7501–0.7882) were next, and similarly to the responses regarding harm to future generations, Georgia held the percentage of agreement (0.8334–0.8571).

4.5 Generational Differences in Climate Change Perception

Of the 289 responses, only 226 from Question 34 were viable and used when analyzing generational differences. Out of the complete sample, 9.3% are Baby Boomers, 17.7% are Generation X, another 17.7% are Millennials and 55.3% are Generation Z. When analyzing the different generations and how they correlate to MFT, Millennials were the only cohort to significantly differentiate ($p<.05$) from at least one other generation. This was found in every foundation except Fairness.

When asked about their belief in climate change, 66.7% of the Baby Boomers, 82.5% of Generation X, 94.8% of the Millennials, and 92.0% of Generation Z all answered that they believed it was happening. Those that do not believe that global warming is happening make up 19.1% of the Baby Boomers, 15.0% of Generation X and 0.8% of Generation Z. Not a single Millennial claimed to not believe in global warming. The remaining 14.3% of Baby Boomers, 2.5% of Generation X, 5.1% of Millennials, and 7.2% of Generation Z claim that they do not know if global warming is happening (See Figure 4.15).

Millennials were the most concerned about global warming, with 89.7% claiming some level of worry about its impacts, 100% believing it will harm future generations to an extent, and 90.0% expressing belief that global warming will harm them personally. Only 60.0% of Baby Boomers, 82.5% of Generation X, and 87.2% of Generation Z expressed that they were either “very worried” or “somewhat worried” about the impacts of global warming.

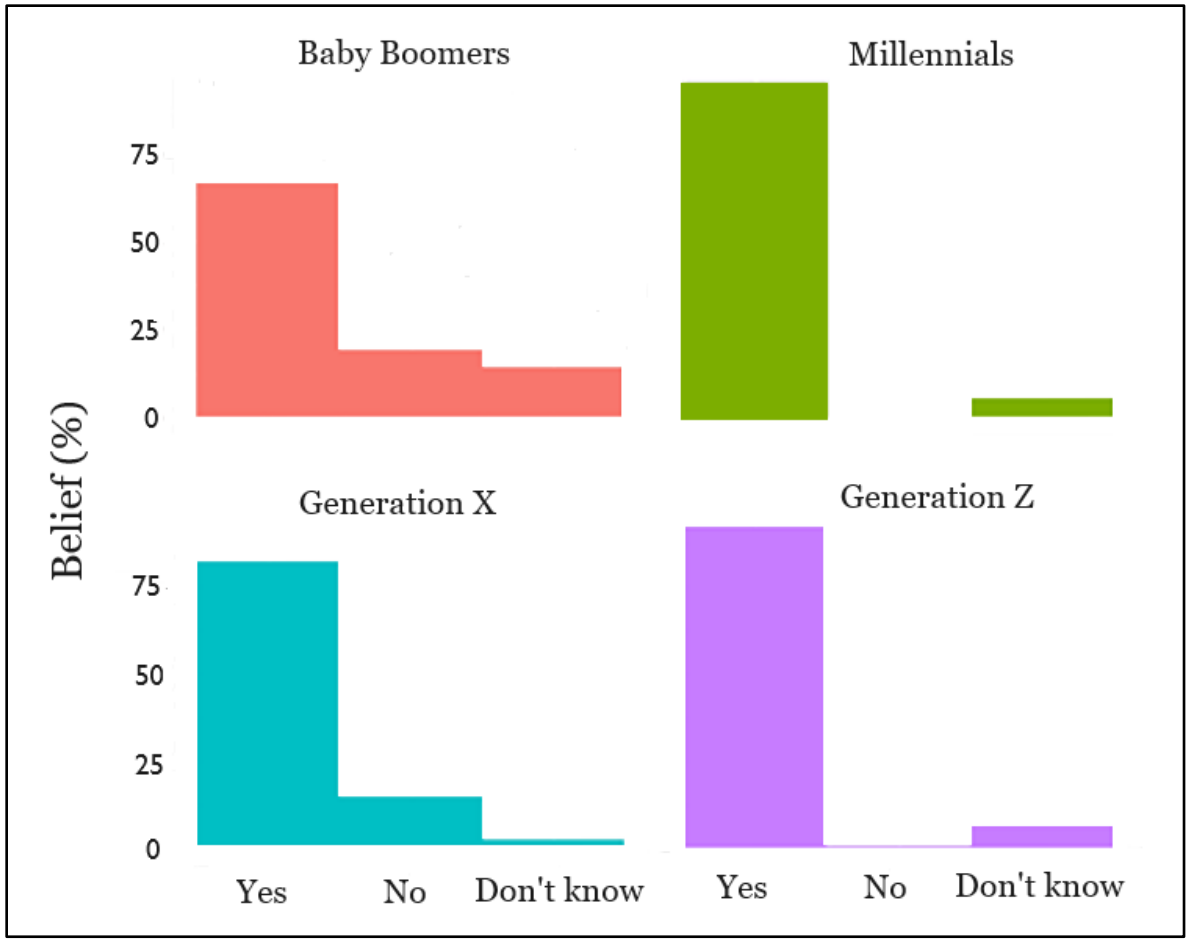

Figure 4.15 *Generational Distribution of Belief in Climate Change*

Figure 4.15 displays bar graphs I constructed in RStudio with the information received from Questions 1 and 34. These graphs communicate a high percentage of each generation believing in climate change, but there is a noticeable difference between the older generations and Millennials and Generation Z.

After Millennials, the generation with the highest percentage of those who believe global warming will harm future generations is Generation Z at 92.0%, followed by Generation X at 82.5%, and then the Baby Boomers at 71.4%. (See Figure 4.16)

When asked whether or not global warming would harm them personally, Baby Boomers' answers spread the most evenly throughout their population compared to the other generations. I found that 19.1% of the Baby Boomers believe global warming will harm them "a great deal," 23.8% agree that it will harm them "a moderate amount," another 19.1% believe that it will harm them "only a little," and the highest percentage, 28.6% do not believe that it will harm them at all. The other three generations have the highest percentage of responses to "a moderate amount," with 47.2% of Generation Z, and 50.0% of Millennials and Generation X believing this. What pushes millennials to have an overall higher percentage of belief that it will harm them personally is the 20.0% of responses claiming that it will harm them "a great deal." While only 10% of Generation X and 11% of Generation Z also choose "a great deal." (See Figure 4.17)

With 82.5%, Millennials have the highest percentage of agreement when asked whether or not they have experienced global warming. They were followed closely by Generation X with 80.0%, in agreement and Generation Z at 79.2%. Lastly, 66.7% of Baby Boomers either agree or somewhat agree that they have experienced global warming. While Baby Boomer's total agreement is the lowest when divided into the two categories of "strongly agree" and "somewhat agree," the percentage of their generation who answered "strongly agree" is higher than that of Generation Z. Out of the Baby Boomers in this sample, 33.3% strongly agree, where that level of agreement was chosen by only 20.8% of Generation Z.

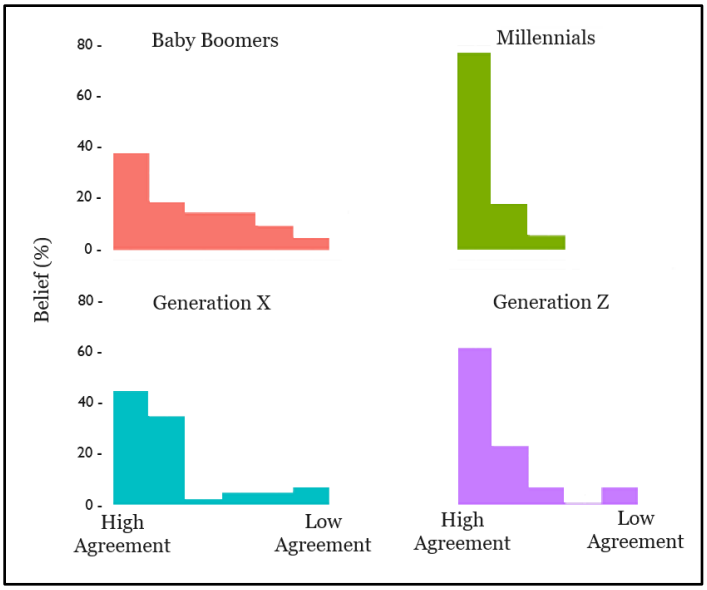

Figure 4.16 *Generational Distribution of Belief that Climate Change Will Harm Future Generations*

Figure 4.16 displays bar graphs I constructed in RStudio with the information received from Questions 4 and 34. These graphs communicate the high level of worry Millennials and Generation Z have for future generations, but the decreased levels that Baby Boomers and Generation X show.

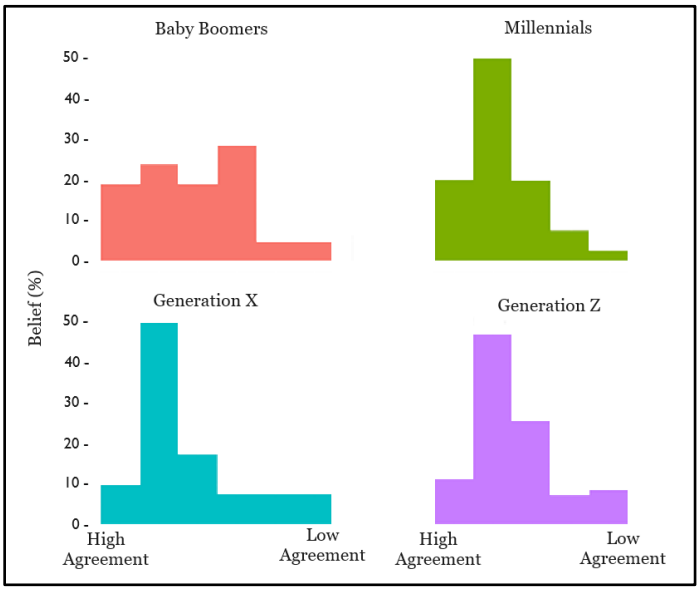

Figure 4.17 *Generational Distribution of Belief that Climate Change Will Personally Harm Them*

Figure 4.17 displays bar graphs I constructed in RStudio with the information received from Questions 5 and 34. These graphs communicate the high level of agreement in Generation X, Millennials, and Generation Z.

More than any other generation, Millennials believe it is their responsibility to act on global warming. 92.5% of their generation are in some degree of agreement when asked this question. Generation Z had the next highest level, but only 76.8% of their generation agreed with the statement, and Generation X followed shortly behind, with 72.5% of their generation also agreeing. The majority of the Baby Boomers in my sample, 57.1%, feel they have a responsibility to do something about global warming (See Figure 4.18).

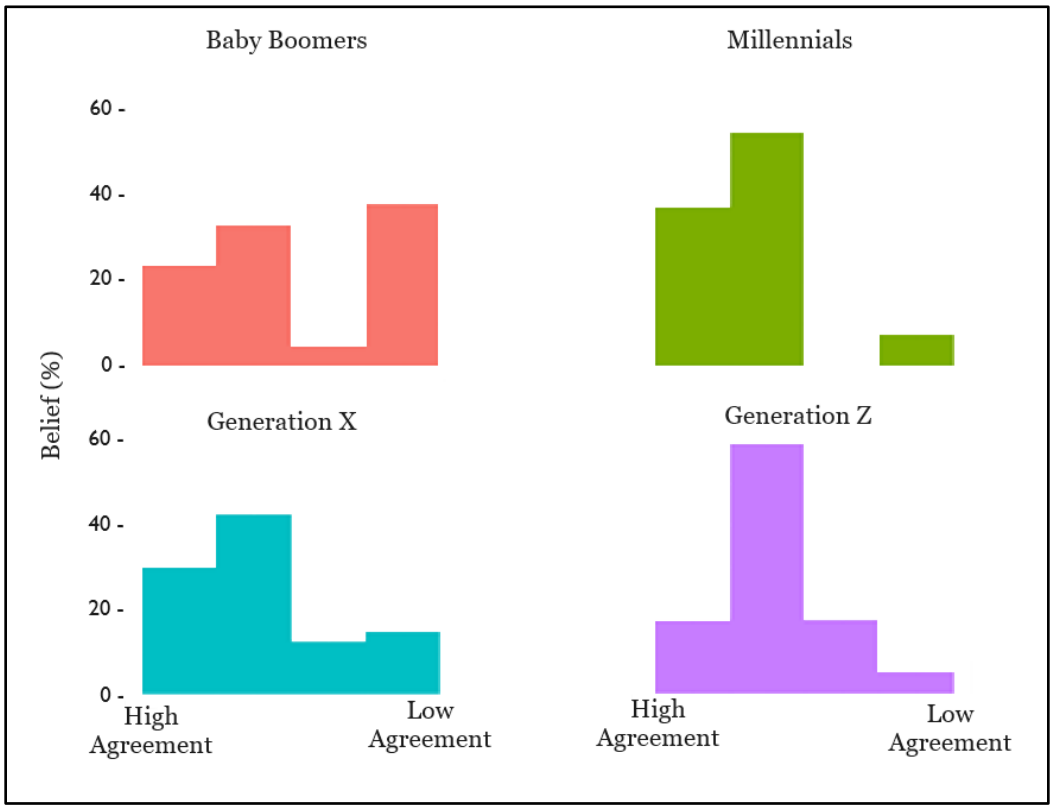

Figure 4.18 *Generational Distribution of Agreement on a Responsibility to do Something About Climate Change*

Figure 4.17 displays bar graphs I constructed in RStudio with the information received from Questions 7 and 34. These graphs communicate the varying levels of agreement toward feeling a responsibility to act on climate change concerns.

CHAPTER V – DISCUSSION & CONCLUSION

5.1 Comparing Perceptions of Climate Change

When compared to the reports presented by the YPCCC and Mason4C, those who responded to my survey shared a much larger belief in climate change (Table 5.1). Their overall percentage of belief is higher than both Mississippi's state average (64.0%) and the national average (72.0%) (Leiserowitz et al., 2023). I found that 87.5% of respondents believe in climate change, and out of those, 85.7% agree that human activity is the culprit. This high prevalence of belief, as well as an overall understanding of the concept of anthropogenic-induced climate change, is surprising and hopeful. Vainio and Paloniemi (2013) agree that climate change is a difficult problem to solve but stress that much of mitigation involves small changes in everyday practices of individuals.

This hope for an emphasis on potential motivators for change goes further than the simple agreement that anthropogenic climate change is occurring. YCOM stated the national average for those agreeing they experienced global warming at 44% and Mississippi's average at 38% (Leiserowitz et al., 2023). My findings, at 78%, were higher than the national average and more than double that of Mississippi. Further, 21.7% of those who haven't experienced any effects still believe in climate change. In Chapter One, I mentioned the effects of COVID-19 and the rapid response due to the visible effects of the virus. My climate perception results, while still lower than complete recognition, provide a promising outlook on providing the level of active response COVID-19 received, but this time directed toward the global issue of anthropogenic climate change

Table 5.1 *Comparing National and State Perceptions Found by YCOM to the Survey Results Found at USM*

Perceptions	*YCOM Mississippi Average*	*YCOM National Average*	*USM*
Belief	64.0 %	72.0%	87.5%
Worry	57.0%	64.0%	83.2%
Future Generations	60.0%	70.0%	82.2%
Personal Harm	41.0%	46.0%	58.2%
Personal Experience	38.0%	44.0%	78.0%

Table 5.1 displays a comparison between the national and Mississippi averages found by YPCCC and Mason4, to the results I found when surveying USM. Presented are the percentage of the population that answered positively to each of the survey questions associated with perception. Those with "Belief" answered that they believe climate change is happening. Those with "Worry" answered that they are worried about the impacts of climate change. Those with "Future Generations" and "Personal Harm" believe that global warming will harm future generations or the respondent personally to some extent. Lastly, those with "Personal Experience" claim that they have personally experienced climate change.

The great amount of awareness towards anthropogenic climate change comes with a sense of overall worry regarding the climate crisis, as well as concern for both the individual person and for future generations. Once again, YCOM stated lower national and state-level averages for all three of these relationships. YCOM shows that the national average of people who are worried about global warming is only 64%, and for Mississippi, it is 57% (Leiserowitz et al., 2023). In regard to believing global warming will harm the individual who is answering, they state the national average at 46% and Mississippi's state average at 41%; however, the national average increases to 70% and the state average increases to 60% when asked if they believe it will harm future generations (Leiserowitz et al., 2023).

I found that 83.2% of USM claim they are worried in general about the effects of global warming; that is 19.2% higher than the national average. When asked whether they believed global warming will personally harm them, 58.2% of USM provided a positive response. Once again, this is 12.2% higher than the national average stated by YCOM, and 15.2% higher than what they stated as Mississippi's average (Leiserowitz et al., 2023).

Understanding that YCOM totals the percentage of two like answers on a 4-point Likert scale is even more telling of the need for a granular level of research, because without combining the results as they did, I found a total of 58.1% belief that global warming will harm future generations, solely within the first answer choice. That alone is only 1.9% less than the entire state average shown by YCOM. When combining my answers as they did, the total percentage of the sample rose to 82.2%. This is 22.2%

higher than the state average and 12.2% higher than the national average, both found by YCOM.

While the study by Sullivan and White (2019) showed that risk perception alone is not enough to influence mitigation, these high percentages, especially when they choose the highest level of agreement, are more influential in driving the necessary awareness, behaviors, policies, and collective and individual actions. This is proven when I added a final aspect of perception, which measured how deeply the respondent agrees to the feeling of having a responsibility to do something about climate change. I found a large majority, 76.8%, of USM believe they feel this sense of responsibility. My findings challenge those of Sullivan and White (2019) because the respondents in my survey who display high levels of overall worry, and concern for themselves and future generations also claim some level of responsibility.

These results underscore the popular misrepresentation of Mississippi with regard to societal trends. When "Thank God for Mississippi" gets used casually by the residents of other states, they are not fully aware that there are places, like institutions of higher education, that hold views and share values that contradict negative stereotypes of the state. Members of the academic community at USM show a higher average belief in climate change and higher levels of risk perception than both the stated national averages as well as what was reported for Mississippi.

If the USM community exhibits these positive perceptions toward climate change, there is a high likelihood that other institutions of higher education here in Mississippi, or the Southeast in general, express the same concerns and awareness. This promotes the idea of focusing on these exceptions instead of reducing these regions down to their

cultural stereotypes. My thesis is in favor of granular research, as it directly opposes what the studies done by YPCCC and Mason4C have distributed. USM is proof that there needs to be a heavier focus on these smaller communities and reducing climate change research to only including large groupings, such as nationwide surveys, is not truly helping the advancements in research. They are only confirming our preconceived notions.

5.2 MFT within Climate Change Belief

I used MFT to better understand how morality influences belief in climate change. This is valuable for further understanding perceptions of climate change because while my results did show high risk awareness, action is more likely to be taken if the event's effects can be evaluated on a more personal level. Moral standpoints cause people to act more so than a basic understanding of the subject as morality speaks to people's humanity (Dickenson et al., 2016).

I found that USM displays a significant connection between *Care* and *Fairness* and the belief that climate change is happening. These results agree with the study by Jansson and Dorrepaal (2015), which used MFT to study the history of climate change norms in Sweden. The connection between *Care* and climate change belief is understandable because climate change is often seen as an event causing harm, whether it is harm towards plants, animals, or people. Any classification of violence against all three of these promotes a negative feeling in those that relate to *Care*. Not only does *Care* have a significant positive correlation to belief in climate change, but it presents that way with responses to climate change harming future generations and whether USM is worried about the effects of climate change. *Care* is tied to concern for others, and climate change

will bring about drastic changes in the environment that threaten what these individuals value. That calls for an active response to combat the situation, which will, in turn, keep those around them from hurting.

When looking at the foundation of *Fairness*, the argument that the effects of climate change are not impartial is seen through their positively correlated response to belief. My findings are similar to those of Jansson and Dorrepaal (2015) and Dawson and Tyson (2012). There is a collective agreement among all these studies in which those who align with *Fairness* agree with climate change perceptions due to current generations harming the well-being of future generations; however, I found no significant difference when correlating personal risk perception and *Fairness*. This can be explained by stating that Fairness ascribes to a concern for whether a situation is equal for all parties, and this concern involves collective well-being and rarely takes into account individual risk. Where these individuals had similar responses to the foundation of *Care*, they came to the same conclusion based on different values. They believe in climate change and are worried about the implications because these events do not affect the world in a fair manner. While their reasoning is different, the implication that this will motivate these individuals to act is the same.

Unlike Jansson and Dorrepaal (2015), who found a negative relationship between *Authority* and belief in climate change, I found no significant correlation for that specific answer. When asked about other areas of perceptions of climate change, however, *Authority* displayed a negative trend. Investigating negative trends is immensely valuable for this area of research because those who disagree with these perceptions are a large part of what is holding back mitigation efforts. Disagreement in terms of *Authority* can be

attributed to the lack of governmental influence on climate change matters. Driving this point further, Jansson and Dorrepaal (2015) state that those who align themselves with *Authority* tend to lean more conservative. They are also more traditional, and scientific research is constantly pushing the boundaries of what is comfortable and previously stated as true. Those who view acts that go against legitimate authoritative figures as immoral do not view climate change perceptions as matters to be dealt with, and that is where efforts to adhere to these types of beliefs and initiate a change that they agree with to save what matters to them is important.

Similar to Jansson and Dorrepaal (2015), I found no significant correlation between *Loyalty* and *Purity* and belief in climate change, although with the extended research I did on the subject, *Loyalty* presents itself very similarly to *Authority*. *Purity* was initially expected to have a higher positive trend; however, with belief there was no significant trend, and the rest was negative. The same concepts of understanding MFT applied to *Care* and *Fairness* also apply here. While these three foundations showed similar trends, and that is beneficial for understanding where to begin conversations and research, they all feel this way for different reasons. *Purity*, while previously hypothesized to have a higher trend due to the uncleanliness of climate change, still displayed negative reactions towards the subject. This could be attributed to the term being outdated or primarily tied to religious beliefs that the population does not view as pertinent anymore.

Overall, understanding how and why these moral foundations dictate perceptions of climate change is vital not only to begin mitigation efforts but to understanding the humanity behind the situation. Scientific and risk perception alone is not enough for the

average human to begin an uncomfortable change, there needs to be an understanding that climate change is an issue that will affect the deepest parts of humanity itself, and morality is one of the areas people make these judgments.

5.3 Geographic Distribution of Climate Change Perception

Geographically pinpointing and grouping accurate perceptions of global warming can prove vital, as the collective view of a region's individuals, local government, school systems, and communities can provide a substantial impact on policies, education, and action toward climate change; however, due to insufficient data, I was unable to run a Local Moran and assess whether my data truly supported the lack of clustered belief within the American Southeast, and even when I generally compared the average perceptions of the state, there was no noticeable distribution. This opens other avenues of research and supports my addition of other areas of perception that need to be explored. If climate change perception is not based on location, then there are other outside factors impacting people’s outlook on the subject.

5.4 Generational Cohorts Differ in Climate Perceptions

I found that Millennials and Generation Z have greater knowledge of and concern toward anthropogenic climate change compared to perceptions shown by Baby Boomers and Generation X. This is consistent with other research on the interaction between generation and climate change perception (Brand, Rausch, and Brandel, 2022: Tyson Kennedy, and Funk, 2021: Swim et al., 2022). When all studies agree on these findings, it shows that generational cohorts are a valid and useful method for evaluating climate perspectives. This information allows researchers to obtain a more cohesive and in-depth

look at all parts of society, and receiving that detailed view is vital for further climate change research.

Throughout this study, Millennials dictate an overarching shift seen throughout the generations with their consistently high values. This can be attributed to their access to more information at a younger age and the additional amount, relative to Generation Z, of time in which they were old enough to be aware of the situation. Further research can assess whether belief is truly declining across Generation Z or if it is due to outside factors such as this lack of experience that they displayed in this research.

Generation Z mentions the necessity to add climate change awareness within education systems (Walker, 2021). This push for action within all educational institutions is promising. Jacquemin, Stofer, and Newberry (2022) produced a study in which they surveyed faculty at institutions of higher education. Their survey sourced questions relating to perceptions of climate change from YCOM, and their results displayed an overwhelming amount of belief and worry towards the effects of climate change (Jacquemin, Stofer, and Newberry, 2022). Unlike the research done by Jacquemin, Stofer, and Newberry (2022), Knight and Hao (2022) and Poortinga and others (2019) I found that the faculty at USM represented the highest number of individuals responding that they did not believe in climate change. This could be due to faculty and staff being older and representing the Baby Boomers and Generation X, with only the youngest faculty being Millennials. Mbah (2024) addresses a similar issue when interviewing educators from various disciplines. He states the possibility that the discrepancy in belief derives from differences in how the faculty members conceptualize climate change (Mbah, 2024).

Even with that, this lack of belief within these sectors of the higher education community highlights two separate notions, the first being a concern for implementation. If some of the highest members of the education system still do not believe in climate change, that push for increasing information to be taught in schools will not happen. The second notion emphasizes a need for learning to not stop outside of a classroom environment. These younger generations are learning immense amounts from their attachment to technology. Whether the will to educate yourself in the subconscious and the latest social media app helps you out or not, promoting factual awareness and evidence towards anthropogenic climate change must be accepted and taught beyond one's years at an institution. One can never stop learning, accepting new ideas, and educating oneself.

Lastly, assessing generational differences is also important for understanding how each cohort deals with crises. Understanding how each generation acted to their influential events, such as 9/11 and COVID-19, allows for a more thorough comprehension of how history dealt with these crises, leading to a better understanding of how future generations will act. The generation following Generation Z is Generation Alpha, and global warming has the potential to be this generation-changing event. Research is already suggesting that climate anxiety is appearing among young people, and Swim and others (2022) make a point that supports Generation Z displaying less belief than Millennials. They claim that these emotional impacts can do more harm than good because they psychologically damage younger generations so much that they see no hope. Without hope, there is no motivation to begin action towards motivation. If their worry is stronger than their hope, that can lead to their risk perception decreasing, which

is shown here. Understanding what drives these cohorts is crucial for a better understanding of how to change for future generations, such as Generation Alpha and the ones following.

5.5 Conclusion

This thesis combines human and environmental geography to analyze human perceptions regarding climate change. I document perception through the lenses of risk awareness, moral foundations, and generational differences. I presented the research at a granular level promoting the psychology associated with climate change, societal motivators, and accurate representation of perceptions, finally stating that all of these factors must be included in the climate conversation.

My research provides evidence that the data collected by YPCCC and Mason4C is limited with regard to the population of Mississippi. The survey I distributed gathered higher levels of awareness and risk perception throughout USM. Using institutions of higher education is beneficial because of the number of diverse viewpoints. Stavrianakis and Farmer (2023) discovered this variability within climate change perceptions among Midwestern and Northeastern universities. Future research should further address the misleading information distributed by YPCCC and Mason4C and seek to document climate change perceptions at more granular scales, such as these public institutions, to gain a more accurate and comprehensive picture of this phenomenon. Climate perception research should not begin and end with national-scale studies.

This research also provides evidence of the need to assess climate change perception using means other than belief and non-belief. Both morality, as illustrated by MFT, as well as generational cohorts play a role in societal-scale patterns of perception,

and they represent valid constructs for conducting climate change research. Future work should analyze morality and gain a better understanding of personal motivators and connect these with climate science to speak more to people's humanity.

Lastly, I believe improving the methodology stated for Research Question Three, and further exploring common beliefs in geographic regions is important for providing a substantial impact on policies, education, and action toward climate change. I obtained insufficient data, but further research could set out to complete what I originally intended on doing and survey an even broader population. Finding trends such as this is especially influential in areas such as the Southeast because they are susceptible to major changes brought on by anthropogenic climate change such as sea-level rise, oceanic heating, tropical cyclone activity, flooding, and erosion.

Anthropogenic climate change is not something easily fixed, and the road to recovery for the planet is going to ask people to give up some comforts that they are not eager to. While that is a hard truth to accept, it is a necessary one. People were made for connection, and if there is still any doubt that people are causing the earth to heat at an unprecedented rate resulting in catastrophic events, look to your neighbor and ask yourself if their life, your life, and the lives of future generations are worth the risk.

APPENDIX A – IRB Approval Letter

Office *of*
Research Integrity

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118 COLLEGE DRIVE #5116 • HATTIESBURG, MS | 601.266.6756 | WWW.USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI using the Incident form available in InfoEd.
- The period of approval is twelve months. If a project will exceed twelve months, a request should be submitted to ORI using the Renewal form available in InfoEd prior to the expiration date.

PROTOCOL NUMBER:	23-0218
PROJECT TITLE:	Perception of Climate Change Among Higher Education Institutions in the Southeastern United States
SCHOOL/PROGRAM	Geography & Geology
RESEARCHERS:	PI: Kelly Wegmann Investigators: Wegmann, Kelly~Cochran, David~
IRB COMMITTEE ACTION:	Approved
CATEGORY:	Expedited Category
PERIOD OF APPROVAL:	05-Apr-2023 to 04-Apr-2024

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

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Climate Change Perception

Start of Block: Consent Block

Q1 Are you 18 or older?

- Yes
- No

Q2 Research Description

1. Purpose: The project aims to document patterns of belief in climate change based on general perceptions of risk and core moral values. After survey responses have been collected an analysis will be performed.
2. Description of Study: The brief ten-minute survey is split into two sections. The first pulls from a study done by the Yale Program on Climate Change Communication, looking at beliefs, reactions to environmental risk, and actions pertaining to global warming. The answers stating a belief or non-belief in climate change will be compared to the national average given by the Yale Program on Climate Change Communication, and through an analysis of these variables, the primary investigator can determine whether or not the sample's risk perception influences their belief in climate change and make assumptions about the population as a whole. The second section looks at social and moral reasoning for beliefs. The assumption is that actions and beliefs are stimulated by foundational values instilled in an individual, and an analysis of survey responses obtained by the primary investigator will allow for further comparison and assumptions relating to the population. The complete survey responses will help answer the research objective of understanding the nature of climate change perceptions across the American South.
3. Benefits: There are no benefits that may occur to the survey members as a result of participation in this study.
4. Risks: There are no known physical, psychological, social, or financial research-related risks, inconveniences, or side effects (expected or potential) for the survey members.
5. Confidentiality: When the survey responses are used for analysis in the thesis, the investigator will maintain participant privacy and anonymity by only revealing information pertaining to university affiliation and non-specific socio-demographic characteristics when permission is given by the surveyed member. All digital files containing participant personal information and affiliations will be kept secure on a password protected computer kept with the

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surveyor at all times.
6. Alternative Procedures: There are no alternative procedures.
7. Participant's Assurance: This project and this consent form have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5125, Hattiesburg, MS 39406-0001, 601-266-5997. Any questions about this research project should be directed to the Principal Investigator using the contact information provided above.

Consent to Participate in Research:
I understand that participation in this project is completely voluntary, and I may withdraw at any time without penalty, prejudice, or loss of benefits. Unless described above, all personal information will be kept strictly confidential, including my name and other identifying information. All procedures to be followed and their purposes were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected. Any new information that develops during the project will be provided to me if that information may affect my willingness to continue participation in the project.

By clicking "Yes" below, I give my consent to participate in this research project. If you do not wish to participate in this study, please close your browser now.

- Yes
- No

End of Block: Consent Block

Start of Block: Block 1

Q1 Do you believe global warming is happening?

- Yes
- No
- Don't know

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Q2 What do you see as the main cause of global warming?

- Caused mostly by human activities
- Caused mostly by natural changes in the environment
- None of the above because global warming isn't happening
- Other
- Don't know

Q3 Are you worried about the impacts of global warming?

- Very worried
- Somewhat worried
- Not very worried
- Not at all worried

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Q4 Do you believe global warming will harm future generations?

- A great deal
- A moderate amount
- Only a little
- Not at all
- Don't know
- Global warming is not happening

Q5 Do you believe global warming will harm you personally?

- A great deal
- A moderate amount
- Only a little
- Not at all
- Don't know
- Global warming is not happening

End of Block: Block 1

Start of Block: Block 2

Q6 How much do you agree with the following statements?

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Q6 I have personally experienced the effects of global warming.

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

Q7 I feel a personal responsibility to do something about global warming.

- Strongly agree
- Somewhat agree
- Somewhat disagree
- Strongly disagree

End of Block: Block 2

Start of Block: MFT Part 1

Q43 When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking?

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Q8 Whether someone suffered emotionally

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

Q9 Whether some people were treated differently than others

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

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Q10 Whether someone's action showed love for his or her country

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

Q11 Whether someone showed a lack of respect for authority

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

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Q12 Whether someone violated standards of purity and decency

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

Q13 Whether someone was good at math

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

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Q14 Whether someone cared for someone weak or vulnerable

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

Q15 Whether someone acted unfairly

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

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Q16 Whether someone did something to betray his or her group

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

Q17 Whether someone conformed to the traditions of society

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

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Q18 Whether someone did something disgusting

- Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
- Not very relevant
- Slightly relevant
- Somewhat relevant
- Very relevant
- Extremely relevant (This is one of the most important factors when I judge right and wrong)

End of Block: MFT Part 1

Start of Block: MFT Part 2

Q45 Please indicate your agreement or disagreement with the following statements:

Q19 Compassion for those who are suffering is the most crucial virtue.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

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Q20 When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

Q21 I am proud of my country's history.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

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Q22 Respect for authority is something all children need to learn.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

Q23 People should not do things that are disgusting, even if no one is harmed.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

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Q24 It is better to do good than to do bad.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

Q25 One of the worst things a person could do is hurt a defenseless animal.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

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Q26 Justice is the most important requirement for a society.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

Q27 People should be loyal to their family members, even when they have done something wrong.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

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Q28 Men and women each have different roles to play in society.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

Q29 I would call some acts wrong on the grounds that they are unnatural.

- Strongly disagree
- Moderately disagree
- Slightly disagree
- Slightly agree
- Moderately agree
- Strongly agree

End of Block: MFT Part 2

Start of Block: Demographic Questions

Q30 In which state were you born?

▼ Alabama ... I was not born in the United States

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Q31 Which state and county/parish do you currently live in?

State
County

▼ Alabama ... Wyoming ~ Weston

Q32 How long have you lived there?

- Less than 1 Year
- 1-2 Years
- 3-5 Years
- 6-10 Years
- 11+ Years

JS

Q33 In which year were you born?

Year	▼ 1900 ... 2049

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Q34 How do you identify?

- Woman
- Man
- Nonbinary
- Other

Q35 Choose one or more race/ethnicity that you consider yourself to be:

- White or European American
- Black or African American
- Native Hawaiian or Pacific Islander
- American Indian or Alaska Native
- Hispanic or Latino/Latinx
- Middle Eastern or North African
- Asian or Asian American
- Other

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Q36 How would you describe your social class?

- Lower class
- Lower-middle class
- Middle class
- Upper-middle class
- Upper class

Q37 Which best describes your position on campus?

- Student
- Faculty
- Staff

Q38 What is your highest level of academic achievement?

▼ High school diploma or equivalent including GED ... Professional degree (JD, MD)

End of Block: Demographic Questions

APPENDIX C – MFQ20 SPSS Syntax File

```
COMPUTE MFQ_HARM_AVG = MEAN(emotionally,weak,animal,compassion)

COMPUTE MFQ_FAIRNESS_AVG = MEAN(unfairly,treated,justice,fairly)

COMPUTE MFQ_INGROUP_AVG = MEAN(betray,lovecountry,history,family)

COMPUTE MFQ_AUTHORITY_AVG = MEAN(traditions,respect,sexroles,kidrespect)

COMPUTE MFQ_PURITY_AVG = MEAN(disgusting,decency,harmlessdg,unnatural)
```

APPENDIX D – Adjusted MFT Equations

Adjusted with Question Number:

COMPUTE MFQ_HARM_AVG = MEAN (Q8, Q14, Q25, Q19)

COMPUTE MFQ_FAIRNESS_AVG = MEAN (Q15, Q9, Q26, Q20)

COMPUTE MFQ_INGROUP_AVG = MEAN (Q16, Q10, Q21, Q27)

COMPUTE MFQ_AUTHORITY_AVG = MEAN (Q17, Q11, Q28, Q22)

COMPUTE MFQ_PURITY_AVG = MEAN (Q18, Q12, Q23, Q29)

Adjusted with Microsoft Excel Column:

COMPUTE MFQ_HARM_AVG = MEAN (W, AC, AO, AI)

COMPUTE MFQ_FAIRNESS_AVG = MEAN (X, AD, AP, AJ)

COMPUTE MFQ_INGROUP_AVG = MEAN (Y, AE, AK, AQ)

COMPUTE MFQ_AUTHORITY_AVG = MEAN (Z, AF, AR, AL)

COMPUTE MFQ_PURITY_AVG = MEAN (AA, AG, AS, AM)

APPENDIX E – Kruskal-Wallis Test Results

K-W[Happening]	
MFT	P-Value
Care	0.0001527
Fairness	0.00026
Loyalty	0.00809
Authority	0.0006688
Purity	0.01962

K-W[Worry]	
MFT	P-Value
Care	3.25E-07
Fairness	0.002986
Loyalty	3.46E-05
Authority	1.29E-07
Purity	9.20E-14

K-W[Personal Harm]	
MFT	P-Value
Care	5.04E-05
Fairness	0.07471
Loyalty	1.07E-03
Authority	4.90E-03
Purity	1.89E-02

K-W[Responsibility]	
MFT	P-Value
Care	5.07E-07
Fairness	0.004571
Loyalty	6.13E-03
Authority	8.80E-03
Purity	1.52E-01

K-W[Future Harm]	
MFT	P-Value
Care	4.84E-06
Fairness	0.001012
Loyalty	1.94E-07
Authority	5.76E-09
Purity	8.18E-05

K-W[Experience]	
MFT	P-Value
Care	2.22E-04
Fairness	0.01396
Loyalty	2.74E-02
Authority	8.12E-04
Purity	1.39E-02

APPENDIX F – Wilcoxon Matched-pairs Signed-rank Test Results

Wilcoxon [Happening & Care]		
	Belief	Non-Belief
Non-Belief	9.90E-05	
Don't Know	0.5689	0.0065

Wilcoxon [Happening & Fairness]		
	Belief	Non-Belief
Non-Belief	0.0006	
Don't Know	0.79936	0.00698

Wilcoxon [Happening & Loyalty]		
	Belief	Non-Belief
Non-Belief	0.5706	
Don't Know	0.0071	0.0475

Wilcoxon [Happening & Authority]		
	Belief	Non-Belief
Non-Belief	0.2238	
Don't Know	0.00074	0.06299

Wilcoxon [Happening & Purity]		
	Belief	Non-Belief
Non-Belief	0.805	
Don't Know	0.016	0.097

Wilcoxon [Worry & Care]			
	Very Worried	Somewhat Worried	Not Very Worried
Somewhat Worried	1.60E-05		
Not Very Worried	9.40E-05	0.16569	
Not At All Worried	0.00021	0.02977	0.29455

Wilcoxon [Worry & Fairness]			
	Very Worried	Somewhat Worried	Not Very Worried
Somewhat Worried	5.12E-02		
Not Very Worried	7.08E-02	0.5343	
Not At All Worried	0.0012	0.0095	0.0782

Wilcoxon [Worry & Loyalty]			
	Very Worried	Somewhat Worried	Not Very Worried
Somewhat Worried	5.20E-05		
Not Very Worried	6.90E-04	0.17997	
Not At All Worried	0.01342	0.66381	0.59558

Wilcoxon [Worry & Authority]			
	Very Worried	Somewhat Worried	Not Very Worried
Somewhat Worried	2.40E-07		
Not Very Worried	5.00E-05	0.338	
Not At All Worried	0.005	0.802	0.315

Wilcoxon [Worry & Purity]			
	Very Worried	Somewhat Worried	Not Very Worried
Somewhat Worried	4.80E-06		
Not Very Worried	3.70E-05	0.035	
Not At All Worried	0.538	0.076	0.018

Wilcoxon [Future Harm & Care]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	7.40E-04				
Only A Little	2.07E-03	0.18544			
Not At All	0.00101	0.01697	0.1888		
Don't Know	0.20092	0.69351	0.18576	0.04592	
GW is not happening	0.00433	0.048	0.3286	0.71913	0.07717

Wilcoxon [Future Harm & Fairness]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	2.18E-01				
Only A Little	1.10E-02	0.08731			
Not At All	0.00053	0.00251	0.04025		
Don't Know	0.25303	0.71023	0.27697	0.01086	
GW is not happening	0.09868	0.20657	0.75434	0.4282	0.35327

Wilcoxon [Future Harm & Loyalty]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	4.40E-08				
Only A Little	4.00E-03	0.8982			
Not At All	0.1477	0.059	0.2848		
Don't Know	0.0037	0.546	0.5932	0.4968	
GW is not happening	0.1086	0.4408	0.695	1	0.5346

Wilcoxon [Future Harm & Authority]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	8.60E-07				
Only A Little	1.00E-04	0.1065			
Not At All	0.232	0.0609	0.0062		
Don't Know	3.40E-05	0.0541	0.6916	0.0056	
GW is not happening	0.2249	0.4716	0.1694	0.828	0.1125

Wilcoxon [Future Harm & Purity]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	2.30E-04				
Only A Little	6.10E-04	0.11127			
Not At All	0.98116	0.10637	0.02815		
Don't Know	0.00697	0.52746	0.54657	0.06681	
GW is not happening	0.55966	0.7379	0.45765	0.77358	0.45418

Wilcoxon [Personal Harm & Care]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	7.24E-01				
Only A Little	3.47E-02	0.00061			
Not At All	0.01509	0.00156	0.33976		
Don't Know	0.05651	0.00968	0.65759	0.78911	
GW is not happening	0.0108	0.00433	0.06019	0.2849	0.16958

Wilcoxon [Personal Harm & Fairness]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	8.08E-01				
Only A Little	3.58E-01	0.105			
Not At All	0.074	0.025	0.177		
Don't Know	0.236	0.109	0.572	0.523	
GW is not happening	0.136	0.109	0.261	0.653	0.435

Wilcoxon [Personal Harm & Loyalty]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	6.19E-01				
Only A Little	5.41E-02	0.00107			
Not At All	0.00909	0.00049	0.20265		
Don't Know	0.45044	0.20532	0.38396	0.11844	
GW is not happening	0.36239	0.15958	0.87981	0.33833	0.68267

Wilcoxon [Personal Harm & Authority]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	2.53E-01				
Only A Little	3.19E-02	0.18529			
Not At All	0.00017	0.00122	0.01432		
Don't Know	8.29E-02	0.30535	0.82481	0.09255	
GW is not happening	0.26415	0.5516	0.94979	0.23684	1

Wilcoxon [Personal Harm & Purity]					
	A Great Deal	A Moderate Amount	Only A Little	Not At All	Don't Know
A Moderate Amount	3.60E-01				
Only A Little	3.36E-02	0.1288			
Not At All	0.0032	0.0026	0.0366		
Don't Know	0.1432	0.412	0.8027	0.1156	
GW is not happening	0.4956	0.7096	0.9298	0.4145	1

Wilcoxon [Experience & Care]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	7.13E-01		
Somewhat Disagree	2.28E-01	0.278	
Strongly Disagree	8.90E-05	3.70E-05	0.0034

Wilcoxon [Experience & Fairness]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	2.96E-01		
Somewhat Disagree	4.39E-01	0.9149	
Strongly Disagree	0.003	0.0038	0.0262

Wilcoxon [Experience & Loyalty]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	1.71E-01		
Somewhat Disagree	6.30E-03	0.0494	
Strongly Disagree	0.0495	0.3621	0.3407

Wilcoxon [Experience & Authority]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	7.43E-02		
Somewhat Disagree	6.20E-04	0.01836	
Strongly Disagree	0.00245	0.05129	0.67539

Wilcoxon [Experience & Purity]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	8.00E-03		
Somewhat Disagree	6.00E-03	0.359	
Strongly Disagree	0.068	0.718	0.662

Wilcoxon [Responsibility & Care]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	2.98E-02		
Somewhat Disagree	9.60E-04	0.01221	
Strongly Disagree	5.50E-06	9.30E-06	0.11205

Wilcoxon [Responsibility & Fairness]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	1.07E-01		
Somewhat Disagree	3.13E-02	0.1633	
Strongly Disagree	0.0015	0.0114	0.2232

Wilcoxon [Responsibility & Loyalty]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	2.80E-03		
Somewhat Disagree	6.86E-02	0.6557	
Strongly Disagree	0.0023	0.3713	0.2397

Wilcoxon [Responsibility & Authority]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	5.50E-03		
Somewhat Disagree	4.21E-02	0.9708	
Strongly Disagree	0.0035	0.2437	0.3479

Wilcoxon [Responsibility & Purity]			
	Strongly Agree	Somewhat Agree	Somewhat Disagree
Somewhat Agree	6.40E-02		
Somewhat Disagree	9.40E-02	0.774	
Strongly Disagree	0.078	0.407	0.761

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