



4-30-2018

# Public Perception & the Planet: Correlation between College Students' Media Exposure to Contradictory News and Their Perceptions of Climate Change

Kasey Andrade

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Public Perception & the Planet: Correlation between College Students' Media Exposure to  
Contradictory News and Their Perceptions of Climate Change

Kasey Andrade

Submitted in Partial Completion of the  
Requirements for Commonwealth Interdisciplinary Honors in Communication Studies  
and Sustainability Innovation and Outreach

Bridgewater State University

April 30, 2018

Dr. Hui Zhang, Thesis Advisor  
Dr. Ryan LaBrozzi, Thesis Advisor  
Dr. Inkyoung Kim, Committee Member

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### **Acknowledgements**

This research was possible due to the work of my two thesis advisors, Dr. Hui Zhang and Dr. Ryan LaBrozzi. I would like to thank them both for their insights, diligence, and commitment to this study. Their expertise and guidance paved the way for this research and greatly contributed to the successful completion of this thesis. I highly valued their advice and direction at each stage of this process and am grateful for their assistance.

I would also like to acknowledge Bridgewater State University, the BSU Honors Program, the BSU Office of Undergraduate Research, and my survey participants for making this research possible. Furthermore, thank you to my family and friends for your constant support and encouragement throughout this process.

### **Abstract**

Public perception of global warming can be defined by a combination of factors, including certainty that most scientists think global warming is happening, certainty about the human causes of global warming, certainty about the occurrence of global warming, and concern about global warming impact (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012). The media plays a critical role in communicating scientific findings to the public and can create an informational bias by providing coverage on viewpoints that do not align with the scientific consensus on climate change. The purpose of this project was to examine if there is a correlation between college students' perceived exposure to conflicting media coverage of climate change and their perceptions of the issue. Understanding how college students perceive the issue is particularly important because this group is vulnerable to misconceptions about the issue and distinctive challenges are associated with changing their attitudes on socio-scientific issues such as climate change. Through an anonymous survey of 132 undergraduate students, this study found that there is a significant correlation between college students' perceived exposure to contradictory media coverage and certainty that most scientists think global warming is happening, along with certainty about the human causes of climate change. This provides an understanding as to which aspects of climate change the media may have more influence in shaping through environmental communication.

## Introduction

Climate change is a significant and pressing issue facing society today that guarantees negative consequences for individuals and populations around the globe. Not only does the scientific community largely acknowledge this problem, but more than 97% of climate scientists endorse the consensus that human activity contributes to climate change (Cook et al., 2013). With this large majority of experts in agreement, many scientists are now taking a serious look at how severely and quickly consequences will arise, such as the spread of disease and an increased frequency of extreme weather events (Jones, 2014). Although the scientific community has developed an overall consensus about the severity of climate change, the general public is less concerned. Research has shown that even with very high public awareness, the issue remains a low priority for a majority of people (Whitmarsh, 2011).

This lack of concern about climate change suggests a failure within environmental communication practices. Environmental communication is directly tied to the media, as most individuals learn about current science-related topics from the media rather than scientific experts (Feldman, 2016). Within school settings, along with exposure to the topic in the media, students associate global climate change with misconceptions, such as being unable to identify the difference between weather and climate, attributing reduced amounts of stratospheric ozone as the main cause for rising global temperatures, and correlating unlinked pollution effects to climate change (Lombardi & Sinatra, 2010). Furthermore, the relationship between environmental communication and the media is important because the media has been shown to be able to influence the public's perception of climate change (Pasquaré & Oppizzi, 2012).

Public perception of global warming can be defined by five factors, including “the perception of scientific agreement on global warming, belief in the human causes of global

warming, certainty that global warming is happening, concern about the impact of global warming, and the valence of expectations regarding the outcomes of taking action on global warming” (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012, p. 16). These five beliefs can be used in combination as an indicator of global warming acceptance (Feldman et al., 2012). This indication can therefore suggest an overall perception of global warming. Climate change is difficult for individuals to understand due to the issue and its potential effects being unobtrusive and complex (Schäfer & Schlichting, 2014). The media has long held an important position in delivering climate change information to the public, with scientists understanding the significance of the media in this role (Schäfer & Schlichting, 2014).

Presenting information about climate change through frames is one way the media is able to exert their influence. Specific frames that can connect to an underlying belief already held by the audience are more likely to be effective (Nisbet, 2009). Framing environmental issues impacts how different populations think about changes in the environment by presenting information in a manner that highlights some components as more important than others (Pasquaré & Oppizzi, 2012). For example, this type of targeted framing is demonstrated by scientists highlighting religious and moral components of climate change in an effort to convince religious leaders that the topic is inherently connected to their faith and communities (Nisbet, 2009). Similarly, if a new government regulation is proposed, advocates may frame the issue by emphasizing potential environmental disasters that can result from climate change, while those opposed to the regulation may frame the issue by focusing on the possible economic costs of the regulation (Nisbet, Hart, Myers, & Ellithorpe, 2013). Due to the power the media holds in this regard, it is important to gain insights and develop an understanding of environmental communication and examine if exposure to conflicting media frames is correlated with the

public's perception regarding climate change. An example of conflicting news can come from the overall tone of the broadcast. This is demonstrated by Fox News being dismissive of climate change in almost 60 percent of their reports, while CNN and MSNBC reports are accepting of climate change in more than 70 percent of the stations' broadcasts (Feldman et al., 2012).

The current research seeks to examine if there is a correlation between college students' perception of global warming and perceived exposure to conflicting media frames on the issue. The current research is novel because it specifically focuses on college students' perception of climate change. There is a dearth of research on this subject, especially when compared to the amount of time that climate change has been a focus of scientific research (Lombardi & Sinatra, 2012). It is significant to understand college students' perception of climate change, as this population is vulnerable to unique challenges, such as having difficulty conceptualizing the issue, due to limited knowledge or misconceptions (Sinatra, Kardash, Taasobshirazi, & Lombardi, 2012).

Today's conflicting media frames about climate change could lead to increased misconceptions for students and impact how they view the issue. Additionally, these misunderstandings are important to recognize because citizens reach voting age during their college years and develop news consumption and voting patterns that they may carry out throughout their lifetime (Diddi & LaRose, 2006). There are 69.2 million millennial individuals of voting age in the United States and just fewer than 69.7 million Baby Boomers who are eligible to vote, with the former having the ability to meaningfully impact the results of an election (Kinery, 2016). College students' perception of today's current issues, such as climate change, which may be related to the media messages they consume, could potentially impact their voting behavior. By specifically investigating the connection between environmental

communication and college students' perception of climate change, this project serves as a basis to gaining an understanding about the correlation between perceptions of climate change and perceived exposure to conflicting media coverage of the issue.

### **Literature Review**

#### **News Media Coverage of Climate Change**

The media uses agenda setting to provide more or less coverage of a debated topic (McQuail, 2010). In this process, conflicting opinions within the public and plans by influential politicians exist and those with different viewpoints compete to highlight the prominence of the issue they deem important (McQuail, 2010). Pressure stemming from high-ranking politicians, public opinion, and real-world events contribute to how the media determines the amount of coverage that will be allotted to each issue (McQuail, 2010). Evidence has suggested that agenda-setting is a function of the mass media, based on individuals and the media having the same definition of what is significant (McCombs & Shaw, 1972). The ability to influence agenda setting provides the news media with significant power in drawing the public's attention to specific topics.

However, the media's power does not stop at agenda setting. Instead, the power is expanded by frames. Frames must "be considered schemes for both presenting and comprehending news" (Scheufele, 1999, p. 106). Furthermore, media frames are "a central organizing idea, or story line that provides meaning to an unfolding strip of events, weaving a connection among them. The frame suggests what the controversy is about, the essence of the issue" (Gamson & Modigliani, 1987, p. 143). Events are perceived by primary frameworks, with these frameworks fostering a way to describe the event (Goffman, 1974). Media framing can be broken down into a process model with input, processes, and outcomes. Organizational pressures

and ideologies act as inputs, frame building serves as the process, and the outcome results in the media frame (Scheufele, 1999). Frames are important, particularly with policy issues, because they shape public opinion and impact behavioral intentions in individuals (Wiest, Raymond, & Clawson, 2015).

Recognizing the combined power of agenda setting and issue framing held by the news media in the United States emphasizes the significant role that the media has in selecting and informing the public on current events. If the media ignores a topic, the public may be uninformed about the issue or see the subject as insignificant, whereas if a matter is heavily covered by the media, individuals may become more likely to be aware of the topic and associate the issue with greater importance. The media's overall influence plays a role in shaping what the public views as important and their perception of the issue. Due to this influential role, it is vital to analyze how the media covers issues, including those related to scientific matters.

One important issue related to media coverage of scientific topics is climate change. This topic is particularly important because people are more likely to learn about scientific issues through media channels than they are to gain information directly from scientists, allowing the media to hold great power and the ability to potentially shape the public's perception of scientific subjects (Scheufele, 2014). The media plays a vital role in delivering scientific messages, as most scientific discoveries need to be translated into language more familiar to the general public (Boykoff & Boykoff, 2007). Scientific language is difficult for the public to comprehend due to the professional nature and specialized knowledge used to describe the findings, as well as the use of caution and probability in scientific commentary (Boykoff & Boykoff, 2007). With the media serving as an important source for scientific information, it is critical to examine media coverage of a topic that has since become controversial: climate change.

One media source that is important to analyze is television, as approximately one third of Americans report television as their main source of science and technology news (Feldman, 2016). During a month-long period in 2013, 65 percent of Americans tuned in to network news, watching on average for 12 minutes per day (Feldman, 2016). In 2016, 12 percent of millennials cited cable news as their top news source (Kinery, 2016). While not as popular amongst millennials, the general public's reliance on television to deliver scientific news and the wide exposure of this media channel makes it one of particular interest for examination.

Cable news has changed drastically since the late 1980s, when climate change arose as a public issue. The changes faced by cable news include both the content covered and new competition from other sources, leading to a smaller desire by cable news outlets to report on complex scientific subjects, and a shift by the media to focus more on politics and delivering messages on issues that match political ideologies on the covered topics (Feldman, 2016). With this change, media audiences have fragmented, and as a result, television networks and programs now target specific segments of the population in narrowcasting and niche programming rather than covering news in an appeal to the general public (Feldman et al., 2012). Along with this more specific appeal, cable news has shifted its focus from broadcasting objectively to voicing opinions. In 2012, CNN, Fox News, and MSNBC spent a combined total of 26 percent more airtime dedicated to discussing opinions than reporting facts (Feldman, 2016).

Opinions on cable news have been influenced by political partisanship associations amongst the networks. Fox News was considered to be the first cable news outlet to explicitly identify with a political party and developed as a channel for conservative messages, closely aligning itself with Republican beliefs (Feldman, 2016). MSNBC rebranded itself in 2008 to identify with a liberal ideology, reflecting Democrat beliefs, and became the most opinionated

outlet amongst MSNBC, CNN, and Fox News by 2012 (Feldman, 2016). In today's society, an individual's political ideology is likely to predict which news outlet he/she watches. With news outlets divided along partisan lines, individuals with a conservative ideology are more likely to watch and trust Fox News, while those with liberal beliefs are more likely to favor a wider variety of news media options, such as CNN, MSNBC, and network news (Feldman, 2016).

These varying political ideologies likely contribute to the different coverage of climate change on the various cable news networks. Fox News, the most conservative network compared to CNN and MSNBC, has provided a platform that is open to climate change denial and amplifies messages that discredit climate science (Feldman, 2016). Fox News' broadcasts have an overall tone that is dismissive of climate change while CNN and MSNBC broadcasts have a more accepting tone. In addition, Fox News has been found to be more likely to include direct statements that challenge aspects of climate change, including scientific consensus, the reality of the issue, and how people contribute to the problem. Contrawise, CNN and MSNBC were found to be more likely to affirm these same aspects of climate change (Feldman, 2016). Moreover, an analysis conducted in 2013 by the Union of Concerned Scientists found that out of Fox News, CNN, and MSNBC, Fox News provided the least accurate coverage of climate change, and that 72 percent of the station's climate-related segments included claims that did not match scientific consensus. In comparison, approximately a third of CNN's climate segments contained inaccuracies, mostly stemming from debates between interview guests who believed in climate change versus guests who challenged the issue, while MSNBC had inaccuracies in 8 percent of its climate-related segments (Feldman, 2016).

The difference in coverage of climate change by partisan media can be further explored by additional content analysis results. An analysis of Fox News, CNN, and MSNBC found that

while Fox News reported on the issue of climate change most often, the reporting of the issue was disproportionately dismissive in regard to the tone used during the coverage. The same analysis found that interview guests on Fox News included a higher ratio of individuals doubting climate change to believers, while MSNBC and CNN's interview guests included a higher ratio of individuals believing in the issue to doubters (Feldman et al., 2012).

Survey results from the same research revealed a correlation between individuals' acceptance of global warming and the cable news station they watched. These results indicated that watching Fox News was negatively associated with global warming acceptance, while watching CNN and MSNBC was positively associated with global warming acceptance (Feldman et al., 2012). Further results indicated that political ideology played an important role in climate change beliefs, but that persuasion could result from cable news viewing. While Democrats' thoughts were mainly consistent regardless of the cable news stations they watched, Republicans' views differed depending on whether or not the individuals watched Fox News, with those watching more Fox News expressing less acceptance of global warming than those watching less Fox News (Feldman et al., 2012).

The results concerning Republicans indicate that cable news coverage can be persuasive. Regardless of whether or not Republicans watched news stations consistent with their political beliefs, their opinions on global warming matched the views communicated by the station (Feldman et al., 2012). This persuasiveness establishes that cable news coverage does play a role in shaping public opinion of climate change and emphasizes the significance of understanding media coverage of climate change.

While cable news plays a dominant role in reporting on climate change, other media sources also contribute to coverage of the issue in an important way. The newswire and news

service community, for example, has been a central source for information on climate change (Antilla, 2005). In an analysis of 255 newspapers, four noticeable frames were discovered: valid science, ambiguous cause or effects, uncertain science, and controversial science (Antilla, 2005). Articles that portrayed a valid science frame examined extreme weather events in California, climate sensitivity/stabilization and a need to transition to clean energy, and the viability of a tropical snail that is threatened by climate change and other factors. These articles did not discuss climate change skepticism and frequently involved the authors of the scientific studies (Antilla, 2005). The newspaper articles that held an ambiguous cause or effects frame indicated an ignorance toward the severity of climate change; these reports de-emphasized scientific findings and focused on topics that shifted focus away from the negative effects of climate change – such as writing about an improved quality in fine wines resulting from warmer temperatures. Frames conveying uncertain science incorporated skeptical language that did not portray confidence in scientific claims (e.g., using phrases that stated there are uncertainties in climate forecasts) (Antilla, 2005). Articles with a controversial science frame included claims from climate skeptics who are known to be connected to the fossil fuel industry (Antilla, 2005). The variety of frames portrayed and topics discussed in the newspaper articles highlights how vastly different the issue of climate change can be depicted in the media, which therefore sends unclear and mixed messages to the public regarding the significance of the issue. These conflicting messages may confuse audiences about different aspects of climate change, including scientific consensus and the severity of the issue. This could lead to the public forming different perceptions on the issue than they would develop if one clear message was communicated to them on a consistent basis.

### **Balanced Reporting of Climate Change**

While climate change has been covered through different frames, some reporters opt to cover the issue by following the journalistic norm of balance. This norm is part of objectivity and attempts to achieve neutrality in reporting (Entman, 1990). In order to achieve balance, journalists provide approximately equal attention to opposing views of an issue (Entman, 1990). However, while balanced coverage may be intended for good, with the goal of the reporting being objective, it does not always lead to accurate coverage. Reporting on global warming in a balanced way can lead to an informational bias (Boykoff & Boykoff, 2004). Informational bias distorts news and results from the combination of adopted professional practices and newsgathering procedures; with global warming specifically, an informational bias is created through media attention being given to views that stray away from the scientific consensus on global warming (Boykoff & Boykoff, 2004). Due to balanced reporting, a small number of global warming skeptics have been able to draw more attention to their views (Boykoff & Boykoff, 2004). This results in conflicting media messages on global warming, as different individuals present opposing views on the issue.

Balanced news media coverage is problematic for global warming because the topic is an unbalanced issue, as there is an overall scientific consensus on global warming with only a small group of skeptics (Boykoff & Boykoff, 2004). Not only is this a problem for the general public, who may be misinformed because of this informational bias, but negative consequences at the governmental level can result as well. One of these outcomes may be delayed action. With journalists following the norm of balanced reporting, an informational bias regarding global warming coverage results, making it more permissible for the United States' government to disregard the pressing need for action to be taken to address the problem (Boykoff & Boykoff,

2004). This delayed action results from balanced reporting because the press will report various calls to action equally, when in reality the scientific consensus is that immediate action must be taken to fight the impacts of global warming; in this context, media coverage of the issue in the United States has been thoroughly lacking (Boykoff & Boykoff, 2004). As a result, balanced coverage is a problematic reporting style for the issue; however, as it is a journalistic norm, balanced reporting continues to be practiced and provides another reason as to why it is important to examine news coverage of climate change and investigate a relationship between this news coverage and public perception of the issue.

### **Scientific Findings Regarding Climate Change**

An individual's news consumption can impact their perception of topics such as climate change, particularly because of the discrepancies between media reporting on the topic and scientific findings. There is an overwhelming consensus from scientists around the world that human activity is contributing to climate change (Patchen, 2006). This anthropogenic cause to climate change relates to human activities that release high levels of certain gases, particularly carbon dioxide, into the atmosphere (Patchen, 2006). As a result, air and sea temperatures rise, precipitation patterns are altered, and there is an increase in extreme weather events, such as hurricanes and storms (Patchen, 2006). With the majority of scientists in agreement that human activities play a role in global warming, the focus in the scientific community has shifted. Instead of debating whether or not anthropogenic climate change exists, scientists have turned their attention to determining how severe the consequences of this change in climate will be, in addition to investigating when these consequences will occur (Jones, 2014).

### **Public Perception of Global Warming**

Nonetheless, the general public is less concerned about the issue of climate change than scientific experts. While the United States is one of the top contributors of annual carbon dioxide emissions, its population is one of the least concerned about climate change (Stokes, Wike, & Carle, 2015). In connection to this lack of concern, the American public perceives global warming to be a low priority issue. When compared to a variety of other concerns in the United States, global warming is steadily ranked as a rather low public priority (Hmielowski, Feldman, Myers, Leiserowitz, & Maibach, 2014). Similarly, out of a list of twenty policy issues, global warming was ranked by Americans as the second to last most important priority for the president and Congress in 2014, only behind dealing with global trade issues (Pew Research Center, 2014). In the 2016 presidential election, the economy and terrorism were the top two issues for voters, with 84 percent and 80 percent of voters indicating that these issues would be important to their decision about which candidate to vote for, respectively (Pew Research Center, 2016). However, millennials have stronger feelings about climate change and these younger voters are more likely to have their vote influenced by energy issues; 63 percent of millennials said energy issues would influence their vote in the 2016 presidential election, while 34 percent of voters age 65 and older said the same (University of Texas at Austin, 2016).

One reason why global warming may be viewed as a low priority in the United States is because Americans are more likely to view the issue as a distant problem than one that is causing people damage today. On a global scale, 51 percent of people believe that climate change is currently causing harm to people across the world, while only 41 percent of Americans believe individuals are currently being harmed by climate change (Pew Research Center, 2014). Instead of a majority of the United States population recognizing climate change as a current and

immediate issue, Americans lean to perceiving the problem as primarily a concern for future generations and individuals in other countries (Hmielowski et al., 2014).

In addition, climate change has become increasingly tied to political beliefs and has developed into a partisan issue. This polarization along political lines has been forming since the late 1990s, with liberals and Democrats generally more concerned about climate change and supportive of political policies to combat global warming (Feldman, 2016). In contrast, conservatives and Republicans are less likely to acknowledge the issue and some may believe that the problem does not exist on any level (Feldman, 2016). This political divide is partly due to differences in levels of trust in scientists, with conservative media serving as an outlet that is part of a denial movement that questions climate change by undermining scientific research (Hmielowski et al., 2014). Democrats and liberals trust scientists at higher and more consistent levels, which helps explain why their view of the issue is more aligned with the overall scientific consensus of anthropogenic climate change than the view of Republicans and conservatives.

### **College Students' Consumption of News**

In addition to recognizing how the issue of climate change is perceived amongst members of the general public, it is also important to develop an understanding of how individuals consume news, as this news consumption can serve as a foundation for people to develop their views. It is particularly significant to analyze college students' consumption of news. College students are at a critical age where they become able to vote and these students develop voting and news consumption patterns that they may practice for the rest of their lives (Diddi & LaRose, 2006). Millennials appear to be taking a greater interest in voting, as voter turnout in the 2016 presidential election increased amongst members in this generation compared to the same generation's voter turnout in the 2012 presidential election, with 49.4 percent of all

eligible millennials reporting to have voted in the 2016 election, compared to 46.4 percent in 2012 (Pew Research Center, 2017). Media channels specifically target college-aged students, as news consumption routines developed during this time in their life lead to lifelong routines and thus viewership (Diddi & LaRose, 2006).

According to a survey conducted by the Pew Research Center, in 2004, the main news source in America for individuals under 30 years old was cable television, with additional news sources being the Internet for one in five individuals, and comedy shows including *Saturday Night Live* and *The Daily Show* for another 21 percent of individuals (Diddi & LaRose, 2006).

However, with the emergence and growing popularity of social media, Facebook and Twitter have now become important news sources (Chan-Olmsted, 2015). Social media has become the main channel college students use to get election news, as a 2016 Pew Research study found that 35 percent of millennials used social media for election news (Kinery, 2016). The second most prominent news source for this generation is now news websites and apps, while only 12 percent prefer to receive news from cable television (Kinery, 2016). This later study compared to the survey conducted in 2004 demonstrates the shift that has taken place in the consumption of news amongst college students and the increasing importance of social media as a tool to consume news. Facebook is a particularly important social media site for news consumption. It was found in a 2015 Pew Research Center Study that 61 percent of millennials used the site to read political news (Kinery, 2016). This understanding of how college students consume news suggests which media channels college students are more likely to be exposed to and gain information from concerning an issue such as climate change.

### **College Students' Perception of Global Warming**

While it is beneficial to examine public perceptions of global warming on a broad scale in order to determine an overarching view of the issue, it is also helpful to investigate how more specific populations, such as college students, view climate change in order to recognize unique challenges these more targeted groups might face when forming an opinion on the topic.

Students experience several misconceptions when they think about climate change. These misconceptions include confusing weather and climate, believing stratospheric ozone depletion is the main reason global temperatures are rising, and believing unconnected pollution impacts – such as litter – are contributing to climate change (Lombardi & Sinatra, 2012). In addition to these misconceptions, students also have trouble differentiating between non-scientific opinions and scientific evidence in regards to climate change (Lombardi & Sinatra, 2012). The misconceptions students have about the issue and the difficulty distinguishing between non-scientific opinion and scientific evidence may interfere with their perception of global warming and make it important to study how this group views climate change.

Adding to these factors, students are an important group to study because of the distinctive challenges associated with changing their attitudes about socio-scientific issues such as anthropogenic climate change (Sinatra et. al, 2012). These challenges include conceptual difficulties and commitment to predetermined views. Regarding conceptual difficulties, it may be challenging for students to fully understand the nature of the issue of climate change because it is complex, multidimensional, and requires systems thinking (Sinatra et al., 2012). This may result in students misunderstanding aspects of the problem and believing there is a debate over whether or not global warming is occurring (Sinatra et al., 2012). Once students develop perceptions about climate change, it can be difficult for them to change these views because they

often become committed to their opinions and resist altering their thoughts (Sinatra et al., 2012). Due to students being committed to the views they develop of climate change, it is important to analyze what these views are, as they can translate into lasting perceptions.

Aside from the previously discussed political affiliation, there are other factors that have been shown to be correlated between college students and their environmental views. These factors include a student's major and their religious beliefs. Students majoring in resource recreation and tourism, biology, and environmental studies have been shown to report more pro-environmental responses than students in other majors (Fusco, Snider, & Luo, 2012). In terms of religious beliefs, Christians in general, and fundamentalists in particular, have shown to be less concerned with issues related to the environment (Fusco et al., 2012). These factors provide some indicators that may play a role in how college students form their perception of climate change. Given the unique challenges students face when forming opinions about climate change and the recognized correlations between certain characteristics of college students and their environmental views, it is important to learn more about how this specific population perceives this issue.

### **Research Question and Hypotheses**

The current study investigates the following overarching research question:

RQ: Is there a correlation between college students' perceived exposure to conflicting media coverage of climate change and their perceptions of the issue?

For this research, perceptions of climate change are conceptualized in four aspects: certainty that most scientists think global warming is happening, certainty about the human causes of global warming, certainty about the occurrence of global warming, and concern about global warming impact (Feldman et al., 2012).

I hypothesize that contradictory information will lead students to not hold a strong view on certainty that most scientists think global warming is happening, certainty about the human causes of global warming, certainty about the occurrence of global warming, and concern about global warming impact. In relation to this, I hypothesize that students receiving a more consistent message on climate change will have their opinions more closely aligned with the viewpoint that is being delivered to them. This hypothesis is based on Feldman, Maibach, Roser-Renouf, and Leiserowitz (2012), whose study found a correlation between individuals' acceptance of global warming and the cable news station these individuals watched. Watching Fox News was negatively associated with global warming acceptance, while watching CNN and MSNBC was positively associated with global warming acceptance. This is also similar to results reported in exposure to contradictory nutrition information in the media, where "exposure to contradictory nutrition information was positively associated with nutrition confusion" (Nagler, 2014, p. 32). Nutrition perception can be similar to that of climate change because both topics have had contradictory information presented to the public by the media; however, this connection may be limited since climate change is a more politically charged subject than nutrition. Based on the relationship between conflicting media exposure and perception for nutrition, I have made the following four predictions for the current study:

H1: The more students perceive to be exposed to contradictory media messages about global warming, the less certain they will be that most scientists think global warming is happening.

H2: The more students perceive to be exposed to contradictory media messages about global warming, the less certain they will be about the human causes of global warming.

H3: The more students perceive to be exposed to contradictory media messages about global warming, the less certain they will be about the occurrence of global warming.

H4: The more students perceive to be exposed to contradictory media messages about global warming, the less they will be extremely concerned or not at all concerned about global warming impact.

## Methodology

### Sample

The study consisted of an anonymous paper survey distributed to 132 undergraduate students at a mid-sized public liberal arts university in the Northeast United States. Participants were recruited from the faculty investigators' courses and by the student investigator asking friends, acquaintances, classmates and other university students unknown to her to complete the survey.

The majority of the students in this sample were seniors (53%), followed by juniors (31.1%), sophomores (12.1%), and freshmen (3.8%). The students had a mean age of 21.98 ( $SD=3.85$ ) and 68.2% identified as female, 30.3% as male, 0.8% as Gender Variant/Non-Conforming, and 0.8% preferred not to answer. In regards to the college associated with their academic major, most students had a major in the College of Humanities and Social Science (59.1%), followed by the College of Education & Allied Studies (14.4%), a combination of majors in two colleges (10.6%), College of Science and Mathematics (8.3%), and College of Business (7.6%). When asked which party best represented their political beliefs, 25.8% of the sample chose Independent, followed by Independent, lean Democrat (24.2%); Democrat (21.2%); Independent, lean Republican (12.9%); Other, or did not select an answer, (11.4%); and Republican (4.5%). In the sample, 10.6% identified as Hispanic. The majority of the sample was

white (83.3%), followed by black or African American (8.3%), Other or did not select an answer (3.8%), Asian or Asian American (2.3%), and Native American/American Indian/Alaska Native (0.8%). In the sample 1.5% of students selected more than one race. The internet was the main source of media for news consumption on government and politics (61.1%), followed by a combination of two or more sources (20.6%), television (14.5%), print (2.3%), and radio (1.5%).

### **Measurement & Scoring**

The measurement for perception of global warming, including defining global warming perception in terms of certainty that most scientists think global warming is happening, certainty about human causes of global warming, certainty about the occurrence of global warming, and concern about global warming impact is adapted from Feldman, Maibach, Roser-Renouf, and Leiserowitz (2012). The variables outlined below, representing items 8 through 22 on the survey instrument (see Appendix), were replicated from the 2012 study.

*Certainty that Most Scientists Think Global Warming is Happening.* Participants were asked to indicate which of the following four statements comes closest to their own views: “most scientists think global warming is happening,” “most scientists think global warming is not happening,” “there is a lot of disagreement among scientists about whether or not global warming is happening,” or “don’t know enough to say.” Following the 2012 study conducted by Feldman, Maibach, Roser-Renouf, and Leiserowitz (Feldman et al., 2012), the responses to this question were collapsed to develop a dichotomous variable, in which the response “most scientists think that global warming is happening” was represented by 1 and the other three responses were represented by 0. The responses from this one item provided a measure of perception of certainty that most scientists think global warming is happening.

*Certainty about the Human Causes of Global Warming.* Participants were asked to indicate which of the following five statements comes closest to their own views: “global warming is caused mostly by human activities,” “global warming is caused mostly by natural changes in the environment,” “global warming is caused by a combination of human activities and natural changes in the environment,” “global warming is not happening,” and “don’t know enough to say.” Following the 2012 study conducted by Feldman, Maibach, Roser-Renouf, and Leiserowitz (Feldman et al., 2012), the responses to this question were collapsed to develop a dichotomous variable, in which the response “global warming is caused mostly by human activities” was represented by 1 and the other three responses were represented by 0. The responses from this one item provided a measure of belief in the human causes of global warming.

*Certainty about the Occurrence of Global Warming.* Participants were asked to indicate their certainty about the occurrence of global warming on a scale of 1 to 9, with 1 being “extremely sure that global warming is not happening,” 5 being “don’t know,” and 9 being “extremely sure that global warming is happening.” Following the 2012 study conducted by Feldman, Maibach, Roser-Renouf, and Leiserowitz (Feldman et al., 2012), the response from this one item provided a measure of global warming certainty ( $M=7.6591$ ,  $SD=1.72024$ ).

*Concern about Global Warming Impact.* Participants were asked to indicate their concern about the impact of global warming on twelve items on a scale of 1 to 7, with 1 being “not at all concerned” and 7 being “extremely concerned.” The twelve items listed included (1) plants, (2) marine life, (3) animals, (4) birds, (5) all people, (6) all children, (7) your children, (8) people in the United States, (9) you, (10) your health, (11) your lifestyle, and (12) your future. Following the 2012 study conducted by Feldman, Maibach, Roser-Renouf, and Leiserowitz (Feldman et al.,

2012), the responses to the twelve items were loaded on a single factor to provide one overall measure on concern about global warming impact ( $\alpha = .964$ ,  $M=5.5681$ ,  $SD=1.32658$ ).

The measurement for contradictory media coverage of climate change is adapted from Feldman, Maibach, Roser-Renouf, and Leiserowitz (2012). The results of the 2012 content analysis portion of the study were used to identify how climate change is reported differently by varying cable news networks (Feldman et al., 2012). The results of the content analysis – including tone toward climate change, and claims of scientific consensus, certainty, and human causes of climate change, became the basis for the current study’s questions to investigate the level of conflicting media exposure participants perceived to have experienced in each of these contexts.

*Contradictory Media Coverage of Climate Change.* Participants were asked to indicate the level of conflicting or contradictory tones they have heard from the media (including television, radio, newspapers, magazines, and the Internet) in the past year in reports about climate change and were provided with the options of “not at all,” “a little,” “some,” and “a lot.” The term “tones” was not defined in the survey and open to participant interpretation. Participants were also asked to indicate the level of conflicting or contradictory information they have heard from the media (including television, radio, newspapers, magazines, and the Internet) in the past year about the following three variables: claims of scientific consensus on climate change, claims of climate change certainty, and claims of human causes of climate change. This was written as three separate questions, with one item listed per question. For each question, participants were provided with the options of “not at all,” “a little,” “some,” and “a lot.” The term “information” was not defined in the survey. The responses to the four items were loaded

on a single factor to provide one overall measure on exposure to contradictory media coverage of climate change ( $\alpha = .860$ ).

### Results

H1: A binary logistic regression was conducted to test whether exposure to contradictory media message about climate change predicted whether or not a student felt certain that most scientists think global warming is happening. The test shows that perceived exposure to contradictory media message about climate change is a significant predictor of whether or not a student felt certain that most scientists think global warming is happening ( $p = 0.016$ ). The odds ratio and confidence interval for exposure was 2.010 (95% CI = 1.138-3.550). This indicates that when exposure is raised by one unit, a student is 2.010 times as likely to not feel certain that most scientists think global warming is happening.

**Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 1 <sup>a</sup>								
Exposure	.698	.290	5.780	1	.016	2.010	1.138	3.550
Constant	-1.091	.878	1.545	1	.214	.336		

a. Variable(s) entered on step 1: Exposure.

H2: A binary logistic regression was conducted to test whether perceived exposure to contradictory media messages about climate change predicted whether or not a student is certain about the human causes of global warming. The test shows that perceived exposure to contradictory media messages about global warming is a significant predictor of whether or not a student believes in human causes of global warming. ( $p = 0.017$ ). The odds ratio and confidence interval for exposure was 2.073 (95% CI = 1.140-3.771). This indicates that when exposure is raised by one unit, a student is 2.073 times as likely to not be certain about the human causes of global warming.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	Exposure	.729	.305	5.707	1	.017	2.073	1.140	3.771
	Constant	-3.137	1.004	9.756	1	.002	.043		

a. Variable(s) entered on step 1: Exposure.

H3: A Spearman test was conducted to test if there was a correlation between perceived exposure to contradictory media messages about global warming and a student's certainty about occurrence of global warming,  $r(130) = 0.196$ ,  $p = 0.024$ . The direction of the correlation was positive, revealing that students who reported more exposure to contradictory media messages about climate change tend to have higher certainty about the occurrence of global warming.

Correlations<sup>b</sup>

		Exposure	Certainty
Spearman's rho	Exposure	Correlation Coefficient	1.000
		Sig. (2-tailed)	.024
	Certainty	Correlation Coefficient	.196*
		Sig. (2-tailed)	.024

\*. Correlation is significant at the 0.05 level (2-tailed).

b. Listwise N = 132

H4: A Spearman test was conducted to test the correlation between perceived exposure to contradictory media messages about global warming and a student's concern about global warming impact,  $r(129) = 0.176$ ,  $p = 0.045$ . The direction of the correlation was positive, which means that students who reported more exposure to contradictory media messages about climate change tend to have higher concern about global warming impact.

**Correlations<sup>b</sup>**

		Exposure	Concern about Impact
Exposure	Correlation Coefficient	1.000	.176*
	Sig. (2-tailed)	.	.045
Concern about Impact	Correlation Coefficient	.176*	1.000
	Sig. (2-tailed)	.045	.

\*. Correlation is significant at the 0.05 level (2-tailed).

b. Listwise N = 131

### Discussion

H1: The results related to H1 indicate that as perceived exposure to contradictory media messages is raised by one unit (i.e. from “Not at all” to “A little,” “A little” to “Some,” or “Some” to “A lot”), a student is 2.010 times as likely to not feel certain that most scientists think global warming is happening. These results align with the prediction made in H1, supporting that the more students are exposed to contradictory media messages about global warming, the less certain they will be that most scientists think global warming is happening. This implies that as students believe they are exposed to higher levels of contradictory information by the media on this topic, their certainty in scientific agreement about the occurrence of global warming will decrease. Identifying and understanding this correlation is important because it indicates a relationship between perceived level of exposure to contradictory media messages about global warming and perception of scientific agreement on the topic. The results of this study found perceived exposure to conflicting media messages on climate change to be significantly correlated with whether or not a student felt certain that most scientists think global warming is happening. This significance suggests that there is a strong connection between perception of exposure to conflicting media messages on the topic and students’ perception of scientific agreement on global warming.

H2: The results related to H2 indicate that when perception of exposure to conflicting media messages is raised by one unit, a student is 2.073 times as likely to not believe in human causes of global warming. These results are consistent with H2, supporting that the more students are exposed to contradictory media messages about climate change, the less certain they will be about the human causes of global warming. Like the results for H1, this implies that when students perceive that they are exposed to higher levels of conflicting media messages about climate change, their certainty about the human causes of global warming will decrease. This correlation is similarly important to understand because it demonstrates a link between perceived exposure to conflicting media messages about the topic and belief in the human causes of global warming. Found to be significantly correlated with certainty about the human causes of global warming, exposure to conflicting media messages about climate change can be interpreted as an important factor associated with students' perception of this aspect of the issue.

H3 and H4: The results related to H3 show that students who reported more exposure to contradictory media messages about climate change tend to have higher certainty about the occurrence of global warming. These results do not support H3, which predicted that the more students are exposed to contradictory media messages about global warming, the less certain they will be about the occurrence of global warming. Similarly, the results related to H4 show that students who reported more exposure to contradictory media messages about climate change tend to have higher concern about global warming impact. These results do not support H4, which predicted that the more students are exposed to contradictory media messages about global warming, the less they will be concerned about global warming impact.

### **Exploratory Follow-Up Tests**

The discrepancy between H3 and H4 and their corresponding results may be related to and explained by gender. Gender is an important variable to recognize, as previous research has found that women are more likely than men to believe that climate change is occurring and that the main cause of the issue is from human activities (Smith Jr., Liu, Safi, & Chief, 2014). Women have also expressed a greater concern about climate change impact than men (Safi, Smith Jr., & Liu, 2012). In addition to worrying more about the effects of climate change, women believe there are more risks associated with the issue and are more likely to identify global warming as being a threat during their lifetime (Pearson, Ballew, Naiman, & Schuldt, 2017). Furthermore, in comparison to men, women are less likely to stand behind denialist views on the subject (Pearson et al., 2017). One explanation for the differences between how men and women view climate change is the vulnerability hypothesis. This hypothesis argues that women are more vulnerable to an array of different environmental threats than men, partly due to women having a more economically disadvantaged status in society (Pearson et al., 2017). These previous findings, along with the vulnerability hypothesis, suggest gender is intuitively related to an individual's perception of climate change, which may contribute to the discrepancy between the predictions and results for H3 and H4.

An independent-samples t-test was conducted to compare certainty about the occurrence of global warming in females and males. The results of this test found that there was not a statistically significant correlation between gender and certainty about the occurrence of global warming. While previous literature supports that women are more knowledgeable about the scientific consensus, current effects, and anthropogenic causes of climate change, it also demonstrates that women perceive themselves to be significantly less knowledgeable about the

subject than men (Pearson et al., 2017). This perception could have contributed to why the findings for this t-test were not significant. An independent-samples t-test was also conducted to compare concern about global warming impact in females and males. There was a significant difference in the scores for females ( $M=5.7843$ ,  $SD=1.01671$ ) and males ( $M=5.0726$ ,  $SD=1.76582$ ), with  $p=0.005$ . The result of the latter independent-samples t-test is consistent with the previous literature and vulnerability hypothesis, which indicates females as having greater concern about global warming impact. As a result, the findings for H4 in this study can be interpreted as being impacted by gender.

An additional factor that may contribute to the findings for H3 and H4 is political party affiliation. Climate change has been increasingly considered a partisan subject, with Democrats and liberals more concerned about the issue (Feldman, 2016). In comparison, Republicans and conservatives are less likely to acknowledge the occurrence of global warming, with some individuals with this political ideology believing that this issue is non-existent (Feldman, 2016). Approximately 85 to 90 percent of Democrats are concerned about global warming, realize the anthropogenic causes, and are aware of the general scientific consensus (Nuccitelli, 2018). In comparison, only 35 percent of Republicans are aware of the anthropogenic causes with a similar number worried about the issue, and 42 percent are knowledgeable about the scientific consensus on the issue (Nuccitelli, 2018). Furthermore, Democrats have shown to hold consistent views on global warming regardless of their cable news consumption, while Republicans' views on the topic have varied to reflect the messages delivered by the cable news outlet they watch (Feldman et al., 2012). This demonstrates that Republicans' views on global warming are more heavily persuaded by the media than Democrats' beliefs about the issue. This previous research supports that political party affiliation is intuitively linked to an individual's perception of climate change,

which may further contribute to the discrepancy between the predictions and results for H3 and H4. See Appendix B for independent-samples t-tests regarding gender and the results for H1 and H2.

To examine this, an independent-samples t-test was conducted to compare certainty about the occurrence of global warming in Democrats/Independents who lean Democrat and Republicans/Independents who lean Republican. There was a significant difference between this variable and political party affiliation, with Democrats/Independents who lean Democrat expressing a higher certainty in the occurrence of global warming ( $M=8.2833$ ,  $SD=1.18023$ ) than Republicans/Independents who lean Republican ( $M=6.8696$ ,  $SD=2.13849$ ),  $p=0.000$ . An independent-samples t-test was also conducted to compare concern about global warming impact in Democrats/Independents who lean Democrat and Republicans/Independents who lean Republican. There was a significant difference in the scores for Democrats/Independents who lean Democrat ( $M=5.9222$ ,  $SD=1.15367$ ) and Republicans/Independents who lean Republican ( $M=4.8297$ ,  $SD=1.81785$ ), with  $p=0.002$ . The results of these independent-samples t-tests are consistent with the previous literature that identifies Democrats as being more certain about the occurrence of global warming and having a greater concern about global warming impact. Therefore, the findings for H3 and H4 can be interpreted as being impacted by political party in this study. See Appendix B for independent-samples t-tests regarding political party affiliation and the results for H1 and H2.

### **Limitations**

Like all research, there are several limitations to the current research that are important to note. First, the survey instrument did not include a definition or example for the terms “conflicting” or “contradictory.” As a result, when participants were asked to indicate the “level

of conflicting or contradictory tones/information” they have heard “from the media (including television, radio, newspapers, magazines, and the Internet) in the past year in reports about climate change, and claims of scientific consensus on climate change, climate change certainty, and human causes of climate change”, it was up to the participants to interpret what they consider to be “conflicting” or “contradictory” tones or information. This may have resulted in varying degrees of understanding of what these terms refer to and may not have been clear to some participants. As such, the results of this study could have been impacted by participants’ different interpretations of the terms “conflicting” and “contradictory.”

Another limitation of this study is the one item measure used to determine certainty about the occurrence of global warming. This item asked participants to indicate their “certainty about the occurrence of global warming on a scale of 1 to 9: 1 being ‘extremely sure that global warming is not happening,’ 5 being ‘don’t know’ and 9 being ‘extremely sure that global warming is happening.’” Following Feldman, Maibach, Roser-Renouf, and Leiserowitz (2012), this single item was used to judge the participant’s certainty about the occurrence of global warming. However comparatively, the measure for concern about global warming impact was based on participants’ responses to twelve items. These responses were loaded on a single factor to provide one overall measure for concern about global warming impact. With both being scale variables, a more thorough understanding for participants’ concern about global warming impact may have been obtained from this study, as there were more individual items for this one measure. Having a more detailed approach, for example including more items, to determine participants’ certainty about the occurrence of global warming, may impact the results by providing a more in-depth understanding of this variable.

The use of both the terms “global warming” and “climate change” is a third limitation of this study. For items 8 through 22, the questions in the instrument included measures to evaluate certainty that most scientists think global warming is happening, certainty about the human causes of global warming, certainty about the occurrence of global warming, and concern for global warming impact, while items 25 through 28 measured participants’ perceived exposure to contradictory coverage of climate change. This different terminology may have impacted results, as the two terms do not share the same definition. Global warming refers to the worldwide trend of increasing temperatures since the early 1900s, while climate change more broadly refers to global phenomena such as sea level rise, glacier melting, and extreme weather events that are primarily a result of burning fossil fuels (NASA, 2018). While related concepts, the terms “global warming” and “climate change” do refer to different occurrences, and it is possible that participants may have held different views or perceptions about global warming compared to climate change. This difference may have impacted the findings in this research, as the present study assumed a consistent and equal viewpoint on global warming and climate change. Future research should consider these limitations.

### **Suggestions for Future Research**

There are several other areas related to this study that are ripe for exploration in future research. One area of interest that could be further analyzed is the correlation between political party affiliation and climate change perception. When examining the results of this study, an independent-samples t-test was conducted to compare certainty about the occurrence of global warming and concern about global warming impact between Democrats/Independents who lean Democrat and Republicans/Independents who lean Republican. For both of these variables, political party affiliation was found to be a significant factor. To further investigate the existence

of a relationship between perception of climate change and political party affiliation, future research should examine how Independents who do not lean Democrat or Republican, or how individuals who feel as though their beliefs are not represented by a political party, view the issue. Furthermore, research could be conducted to study if there is a correlation between other political party affiliations aside from Democrat and Republican, such as the Green Party, and perception of climate change.

In addition, future research could investigate whether there is a correlation between college students' majors and their perception of climate change. While previous research has shown that students majoring in resource recreation and tourism, biology, and environmental studies report more pro-environmental responses than students in other majors, future research should further explore this relationship (Fusco, Snider, & Luo, 2012). For example, rather than investigating a more general relationship between college major and environmental views, a more specific study could focus on determining if there is a correlation between college major and views on climate change. This additional study, which was not done as part of the current research due to participants not declaring their specific major and not equally representing the university's four academic colleges, could also compare differences that may exist between students with various majors, not only between science majors and non-science majors but students of all areas of study. This further investigation could help determine if college major is correlated with a student's perception of climate change.

Investigating if there is a correlation between college students' primary news sources and their perception of climate change is a third suggestion for future study. This research included an item to collect data on college students' primary sources for news about government and politics; however, additional research can examine where college students get their news

specifically about climate change. As a result, this research would seek to determine if there is a correlation between where students primarily get their news about the topic (i.e. television, radio, print, or the Internet), and their perception of the issue. Furthermore, data can be collected on the specific news sources students use to gain information about climate change, such as specific television stations, websites, radio stations, and newspapers or magazines. This research would help determine where students get their news and if there is a relationship between primary news sources and students' views on climate change.

### **Conclusion**

Largely acknowledged by the scientific community, climate change is a current issue in today's society that assures an array of negative consequences for both current and future generations. Despite the scientific consensus, and even with high public awareness, the general public is less alarmed and the issue has remained a low priority (Whitmarsh, 2011). This highlights how environmental communication practices from the media, a more popular source for science-related topics than science experts themselves, have failed to deliver messages about climate change that convey its urgency. This is significant, as the media is able to help shape the public's perception of climate change (Pasquaré & Oppizzi, 2012). The media's impact is heightened through framing, which is especially important with environmental issues as it influences how populations view changes in the environment based on some information being presented in a way that makes it seem more important than other information (Pasquaré & Oppizzi, 2012).

This research focused on investigating whether or not a correlation exists between college students' perception of global warming and perceived exposure to conflicting media frames on the issue. This study specifically sought to examine college students' perception of global

warming because of the limited research previously conducted on this specific population in comparison to the amount of research conducted on climate change (Lombardi & Sinatra, 2012). Additionally, students face distinctive challenges about climate change, including trouble conceptualizing the issue, making it important to gain a better understanding of how this group views the issue. To analyze the overarching research question, perception of climate change was examined.

The results of this research found that as perceived exposure to contradictory media messages is raised by one unit (i.e. from “Not at all” to “A little,” “A little” to “Some,” or “Some” to “A lot”), college students are more likely to not feel certain that most scientists think global warming is happening and not be certain about the human causes of global warming. The results of this study also indicated that college students who report higher levels of exposure to contradictory media messages about climate change tend to have higher certainty about the occurrence of global warming and have a higher concern about global warming impact. These findings may have been intuitively connected to the participants’ gender and political party affiliation. That is, gender and political party were found to be significantly correlated with concern about global warming impact. Political party was additionally found to be significantly correlated with certainty about the occurrence of global warming. In regards to these findings, females and Democrats/Independents who lean Democrat had higher concern about global warming impact than males and Republicans/Independents who lean Republican. Additionally, Democrats/Independents who lean Democrat had higher certainty about the occurrence of global warming than Republicans/Independents who lean Republican.

The overall results revealed that there is a correlation between at least some aspects of climate change perception (certainty that most scientists think global warming is happening and

certainty about human causes of global warming) and perceived exposure to contradictory media messages in college students, while other elements of perception of the issue (certainty about the occurrence of global warming and concern about global warming impact) may be more closely linked to other factors, such as gender and/or political party affiliation. This is important to recognize, as it provides a more thorough understanding of the factors that may impact college students' overall perception of climate change. With college students being of voting age and millennials making up a significant proportion of eligible voters, this demographic has the capability to meaningfully influence election results (Kinery, 2016). As climate change has increasingly developed into a partisan issue, election outcomes may become more critical in the steps taken to deal with the issue and its consequences. This is significant amongst college students in particular, as millennials have indicated that energy issues do influence their voting behavior (University of Texas at Austin, 2016). It is therefore important to understand how college students are consuming news on this topic and their perceived exposure to conflicting messages. The areas of climate change perception that were found to be significantly correlated with college students' perceived exposure to conflicting media messages on the topic provide a basis to understanding which aspects of the subject the media may have more influence in shaping through environmental communication.

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**Appendix A****1. What is your class year classification?**

- Freshman (0-23 earned credits)
- Sophomore (24-53 earned credits)
- Junior (54-83 earned credits)
- Senior (84 or more earned credits)

**2. In which college does your academic major(s) belong? If you have more than one declared major, select all colleges that apply.**

- Bartlett College of Science and Mathematics (*Biological Sciences, Chemical Sciences, Computer Science, Geography, Geological Sciences, Mathematics, Physics*)
- College of Education and Allied Studies (*Communication Sciences and Disorders, Counselor Educations, Elementary and Early Childhood Education, Movement Arts, Health Promotion and Leisure Studies, Secondary Education and Professional Programs, Special Education*)
- College of Humanities and Social Sciences (*Anthropology, Art, Communication Studies, Criminal Justice, Dance, Economics, English, Global Languages and Literatures, History, Music, Philosophy, Political Science, Psychology, School of Social Work, Sociology, Theatre*)
- Ricciardi College of Business (*Accounting and Finance, Aviation Science, Management*)
- Undeclared Major

**3. To which gender identity do you most identify?**

- Female
- Male
- Transgender Female
- Transgender Male
- Gender Variant/Non-Conforming
- Not Listed (Please Specify: \_\_\_\_\_)
- Prefer Not to Answer

**4. What age did you turn on your last birthday?**

\_\_\_\_\_

**5. Which political party best represents your political beliefs?**

- Democrat
- Independent, lean Democrat
- Independent
- Republican
- Independent, lean Republican
- Other (Please Specify: \_\_\_\_\_)

**6. Are you of Hispanic, Latino, or Spanish origin, such as Mexican, Puerto Rican, or Cuban?**

- Yes
- No

**7. Which of the following describes your race?**

- White
- Black or African-American
- Asian or Asian-American
- Native American/American Indian/Alaska Native
- Native Hawaiian/Other Pacific Islander

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**8. Please indicate which of the following comes closest to your own views:**

- Most scientists think global warming is happening
- Most scientists think global warming is not happening.
- There is a lot of disagreement among scientists about whether or not global warming is happening.
- Don't know enough to say.

**9. Please indicate which of the following comes closest to your own views:**

- \_\_\_ Global warming is caused mostly by human activities.
- \_\_\_ Global warming is caused mostly by natural changes in the environment.
- \_\_\_ Global warming is caused by a combination of human activities and natural changes in the environment.
- \_\_\_ Global warming is not happening.
- \_\_\_ Don't know enough to say.

**10. Please indicate your certainty about the occurrence of global warming on a scale of 1 to 9: 1 being “extremely sure that global warming is not happening,” 5 being “don’t know” and 9 being “extremely sure that global warming is happening”**

Extremely sure that global warming is not happening								Extremely sure that global warming is happening
	Don't know							
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**11. Please indicate your concern about the impact of global warming on plants on a scale of 1 to 7: 1 being “not at all concerned” and 7 being “extremely concerned”**

Not at all concerned						Extremely concerned
1	2	3	4	5	6	7
<input type="checkbox"/>						

---







**21. Please indicate your concern about the impact of global warming on your lifestyle on a scale of 1 to 7: 1 being “not at all concerned” and 7 being “extremely concerned”**

Not at all concerned								Extremely concerned
1	2	3	4	5	6	7		
<input type="checkbox"/>								

---

**22. Please indicate your concern about the impact of global warming on your future on a scale of 1 to 7: 1 being “not at all concerned” and 7 being “extremely concerned”**

Not at all concerned								Extremely concerned
1	2	3	4	5	6	7		
<input type="checkbox"/>								

---

**23. Please indicate all of the items that you believe are true**

**Taking national action on global warming would...**

- Help free us from dependence on foreign oil
  - Improve people’s health
  - Save many plant and animal species from extinction
  - Prevent the destruction of most life on the planet
  - Cost jobs and harm our economy
  - Cause energy prices to rise
-

**24. Thinking specifically about government and politics, do you get most of your news about this topic...**

\_\_\_ On television (See 24a)

\_\_\_ On the internet (See 24b)

\_\_\_ On the radio (See 24c)

\_\_\_ In print (See 24d)

**24a.** \*Answer only if you selected “On television” for question 24. Which television outlet or program do you turn to most often for news about government and politics? Please list the name of the outlet or program:

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**24b.** \*Answer only if you selected “On the internet” for question 24. Which source on the internet do you turn to most often for news about government and politics? Please list the name of the internet source:

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**24c.** \*Answer only if you selected “On the radio” for question 24. Which radio program or station do you turn to most often for news about government and politics? Please list the name of the program or the letters of the station (Please DO NOT just list the station numbers):

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**24d.** \*Answer only if you selected “In print” for question 24. Which print source do you turn to most often for news about government and politics? Please list the name of the print source (If a newspaper, also include the city where it is from):

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**25. Please indicate the level of conflicting or contradictory tones you have heard from the media (including television, radio, newspapers, magazines, and the Internet) in the past year in reports about climate change**

Not at all

A little

Some

A lot

**26. Please indicate how much conflicting or contradictory information you have heard from the media (including television, radio, newspapers, magazines, and the Internet) in the past year about claims of scientific consensus on climate change**

Not at all

A little

Some

A lot

**27. Please indicate how much conflicting or contradictory information you have heard from the media (including television, radio, newspapers, magazines, and the Internet) in the past year about claims of climate change certainty**

Not at all

A little

Some

A lot

**28. Please indicate how much conflicting or contradictory information you have heard from the media (including television, radio, newspapers, magazines, and the Internet) in the past year about claims of human causes of climate change**

Not at all

A little

Some

A lot

## Appendix B

### Exploratory Follow-Up Tests for H1

#### Gender

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.588 <sup>a</sup>	3	.086
Likelihood Ratio	7.629	3	.054
Linear-by-Linear Association	4.566	1	.033
N of Valid Cases	131		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .27.

A Chi-Square test was conducted to compare certainty that most scientists think global warming is happening in females and males. The results of this test found that there was not a statistically significant correlation between this variable and gender.

#### Political Party Affiliation

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.273 <sup>a</sup>	2	.010
Likelihood Ratio	8.876	2	.012
Linear-by-Linear Association	2.258	1	.133
N of Valid Cases	131		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.88.

A Chi-Square test was conducted to compare certainty that most scientists think global warming is happening in Democrats/Independents who lean Democrat, Republicans/Independents who lean Republican, and all other responses to political party affiliation (including Independent, Other, and no answer). The results of this test found a statistically significant correlation between this variable and political party affiliation.

## Exploratory Follow-Up Tests for H2

### Gender

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.581 <sup>a</sup>	3	.134
Likelihood Ratio	5.760	3	.124
Linear-by-Linear Association	5.036	1	.025
N of Valid Cases	132		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .30.

A Chi-Square test was conducted to compare certainty about the human causes of global warming in females and males. The results of this test found that there was not a statistically significant correlation between this variable and gender.

### Political Party Affiliation

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.697 <sup>a</sup>	2	.021
Likelihood Ratio	8.073	2	.018
Linear-by-Linear Association	4.062	1	.044
N of Valid Cases	132		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.97.

A Chi-Square test was conducted to compare certainty about the human causes of global warming in Democrats/Independents who lean Democrat, Republicans/Independents who lean Republican, and all other responses to political party affiliation (including Independent, Other, and no answer). The results of this test found a statistically significant correlation between this variable and political party affiliation.<sup>i</sup>

<sup>i</sup> The exploratory follow-up tests show that gender is significant only for concern about global warming impact (aligning with the vulnerability hypothesis), while political party affiliation is significant for certainty that most scientists think global warming is happening, certainty about the human causes of global warming, certainty about the occurrence of global warming, and concern about global warming impact.