

Media Use and Climate Change Skepticism

By

Alexandria Vogl

A Thesis Submitted in
Partial Fulfillment of the
Requirements for the Degree of

Master of Science (Communication)
Program (Mass Communication)

At

The University of Wisconsin-Whitewater

August, 2020

Graduate Studies

The members of the Committee approve the thesis of

Alexandria Vogl presented on July 29th, 2020

Dr. Edward Frederick, Chair

Dr. Amal Ibrahim

Dr. Ndirangu Wachanga

Abstract

This study examines the relationship among demographic and media variables impacting individual's climate change skepticism or belief. This study also examines the relationship among climate change skepticism or belief and individual's willingness to adopt pro-environmental behaviors. Six hundred and two undergraduate students completed this study's survey regarding their news and entertainment media habits, skepticism towards climate change, and pro-environmental behaviors. Multiple regression analyses indicate that political orientation and gender have the largest effect on climate change skepticism. Results also show that entertainment media use was significant with climate change skepticism, while news media use was significant with climate change belief. While limited support was found to explain the relationship among climate change skepticism or belief and individual's willingness to pursue pro-environmental behaviors, self-reported climate change knowledge had the largest influence.

Introduction

Over recent decades, there has continually been a global debate on the environmental issue of climate change. Some individuals believe climate change is an important issue and finding solutions is something that should be made a high priority while others are extremely skeptical of climate change and don't perceive it to be a pressing matter (Leiserowitz, Maibach, Rosenthal, Kotcher, Bergquist, Ballew, Goldberg, & Gustafson, 2019). Similarly, some individuals think it is necessary to behave in ways that are pro-environment while others are not concerned about how their behaviors affect the environment (Leiserowitz, Maibach, Rosenthal, Kotcher, Bergquist, Gustafson, Ballew, & Goldberg, 2019). Since the beginning forms of traditional media, and now especially in new media, we have been encountering messages about climate change and individuals continue to have contrasting beliefs.

The first purpose of this study is to examine the relationship between audience members' political orientation and climate change skepticism or belief. Additionally, the relationship between media consumption and audience members' skepticism toward or belief in climate change will be examined. This study uses eight independent variables to assess media consumption: the number of minutes one spends on different forms of media for news, the number of minutes one spends for entertainment content, news broadcast networks one watches, exposure one has to climate change news, exposure one has to entertainment content about climate change, how much attention is given to a news stories about climate change, how much attention is given to entertainment content about climate change, and how credible one perceives the source of media to be. The second

purpose of this study is to examine the relationship between climate change skepticism or belief and individual's intentions to behave in ways that are pro-environment.

Literature Review

Climate Change Response

According to the U.S. Global Change Government website, Earth's temperatures are now changing faster than at any point in civilization history as a result of human activities, since there are no apparent natural cycles on record to explain this change in temperature. What has especially caused this change is the emissions of heat-trapping greenhouse gases from fossil fuel, combustion, deforestation, and land-use change (2019). As a result of these human activities and increased temperatures, there has been an increase in heavy precipitation events: glaciers and snow cover are shrinking; seas are warming, rising, and becoming more acidic; wildfires occur more frequently; flooding is becoming more frequent; and many species are migrating to new habitats (U.S. Global Change Research Program, 2019). With all of these observed effects, it is apparent that the Earth's increasing temperatures is an issue for humankind. It is also apparent that there is no other explanation for these effects, aside from human activity (U.S. Global Change Research Program, 2019). However, regardless of these facts backed by scientific research, many individuals remain skeptical that that climate change is a real problem or that human activities are creating a change in Earth's temperatures.

A 2016 survey showed that 18% of Americans are alarmed and fully convinced of the reality and seriousness of climate change, 33% are concerned and convinced that

climate change is a serious problem but are not personally engaged in the issue, 19% of Americans are cautious and believe that global warming is occurring but their belief is weak, 12% are disengaged and give the issue little thought, 11% are doubtful and don't believe that global warming is a threat, 7% of Americans are dismissive and are very sure it is not happening and are actively fighting against national efforts to reduce greenhouse gas emissions (Leiserowitz, Maibach, & Roser-Renouf, 2016). While this study showed that the majority of American's are concerned over the issue of climate change, there are still some who are disengaged, doubtful, and dismissive of the issue. Another survey from 2015 showed that 10-15% of Americans did not believe that climate change was occurring at all, while 30-40% believed it was occurring but as a result of natural causes rather than human activities (Hamilton, Lawrence, Hartter, Lemcke-Stampone, Moore, Safford, 2015). In addition to the skepticism towards climate change that American's have, this study shows the skepticism towards the idea that human activities are causing the climate's temperatures to change.

Additionally, Gallup surveyed Americans over a seven-year period and found that individuals' attitudes towards climate change have been shifting. In 2004, 26% of respondents said they worried "a great deal" about climate change, and in 2007, this proportion rose to nearly half, at 41%. However, by 2010, this dropped to 28% (Brulle, Carmichael, Jenkins, 2012). Rather than the findings provided by the previous cross-sectional surveys, this longitudinal survey provides insight into how climate change skepticism has changed over time.

Climate Change Skepticism

While it is clear that many Americans are skeptical of climate change, it is also clear that individuals are skeptical of the idea that human activities are causing this increase in climate temperatures. Several studies have examined variables that contribute to this skepticism. Santos (2017) outlines several explanations as to what causes an individual to be skeptical of climate change. Most notable of these are political ideology and lack of knowledge. Whitmarsh (2011) also looked at political values in addition to certain demographic factors. The findings showed that men are more skeptical than woman, those in higher income households (\$85,000+) were more skeptical than those in lower income households, and those who politically identify as conservative were the most skeptical (Whitmarsh, 2011). Similarly, another study found that conservative white males were significantly the most likely to endorse all five items measuring denial of climate change (McCright & Dunlap, 2011). In each of these studies, respondents who identified as a conservative male were found to be the most skeptical of climate change.

Researchers Gifford & Nilsson (2014), Liu, Vedlitz, & Shi (2014), Milfont, Milojev, Greaves, & Sibley (2015) also found that those who are politically conservative are less likely to believe in climate change, less likely to be concerned about the environment, and more likely to not be concerned with behaving in ways that are pro-environment (as cited in Santos & Feygina, 2017). Undoubtedly, political orientation is an important variable predicting whether or not an individual is skeptical of climate change; those who identify as conservative are consistently found to be skeptical. Gender

is also a significant variable; those who identify as male are consistently found to be more skeptical of climate change information.

Climate Change Knowledge

As previously stated, Santos (2017) found that the amount of knowledge an individual has on climate change can also impact his or her attitudes towards the issue and determine how skeptical he or she is. When an individual has more knowledge on climate change, he or she is more concerned about the problem. Tobler, Visschers, & Siegrist (2012) examined the relationship between climate change knowledge and the acceptance of climate change, finding that climate change knowledge was positively correlated with concern and negatively correlated with skepticism. With this finding, it can be said that when individuals have more knowledge on climate change, they are less skeptical of it. Shi, Visschers, & Siegrist (2015) expanded off this study and also found that the more knowledge about climate change an individual has, the more concerned he or she is about climate change. Guy, Kashima, Walker, & O'Neill (2014) again found that having more knowledge is positively related to climate change beliefs; specifically, they found that having knowledge on what is causing climate change is associated with stronger climate change beliefs. Similarly, it has been shown that having more climate change knowledge can overcome anthropogenic climate change skepticism (Stevenson, Peterson, Bondell, Moore, & Carrier, 2014). When individuals have more climate change knowledge, they are more likely to believe in climate change, and believe that human activities are causing it.

Behavioral Intentions

Both the skepticism an individual has towards climate change and his or her knowledge of the issue can also affect the individual's behavioral intentions. Shi, et al. (2015) found that the more concerned about the problems caused by climate change an individual is, the more willing he or she is to change his or her behaviors in ways that are pro-environmental. Shi, et al. (2015) also found that when an individual has more knowledge on pro-environmental behaviors, he or she is more likely to adopt those behaviors. With this, it can be said that when individuals believe in climate change and the problems it can cause, the more willing they will be to adopt pro-environmental behaviors. Whereas, if individuals are skeptical of climate change, they will take no initiative for themselves to change their behaviors. Another study yielded similar findings. This study found that after participants were exposed to information on climate change, they expressed greater willingness to take mitigative actions to reduce their carbon footprint (Sinatra, Kardash, Taasobshirazi, & Lombardi, 2010). This same study also showed that when individuals are more accepting of the idea that human activities are creating a change in climate temperatures, they express that they are more willing to act in pro-environmental ways (Sinatra et al., 2010). Again, this shows the relationship between individual's climate change beliefs and their behavioral intentions. In all of these studies' findings, it is clear that when individuals believe that climate change is a problem and believe that human activities are causing the problem, they are more willing to change their behaviors in ways that are pro-environment.

Climate Change in the Media

Media coverage of climate change directly affects the level of public concern for the issue, when there is greater quantity of media coverage of climate change, there are greater levels of public concern (Carmichael & Brulle, 2016). Media can act as a catalyst to provide the masses information related to climate change issues (Yadav & Rani, 2011). Additionally, the type of media coverage also affects the level of public concern. The more that individuals use conservative media, the less certain they are that climate change is happening, and the more that individuals use non-conservative media, the more certain they are that climate change is happening (Hmielowski, Feldman, Myers, Leiserowitz, & Maibach, 2014). When media coverage represents political ideologies that are more conservative, audience members are more skeptical of climate change, and audience members are less skeptical of climate change when the media coverage is non-conservative. In addition, media consumption has been shown to have a certain influence on awareness of climate change problems. A longitudinal research study demonstrated that, over time, people's media use directly influences their beliefs about climate change (Hmielowski et al., 2014). One study showed that individuals who use public news programs were more aware of climate change problems than individuals who did not watch any news or only watched commercial programs (Arlt, Hoppe, & Wolling, 2011). When individuals inform themselves on climate change problems via public news programs, they had better awareness of these problems than those who only used commercial programs to be informed.

Many different forms of media are available now to audiences. Individuals can choose from Internet-based sources like web pages and social media, cable television networks, broadcast television networks, newspapers, and radio. When it comes to different forms of media, one study revealed that the main form of media used and relied on for obtaining information about climate change was television followed by newspaper, and then the Internet (Huang, 2016). Arlt et al. (2011) showed this as well by stating that high usage of television news, print media, and online media strongly affected individual's climate change problem awareness. Another study also indicated that television was the main form of media that increased people's level of knowledge on climate change, problem awareness, and willingness to assume responsibility (Taddicken, 2013). In addition to the different types of media, exposure to and attention to media coverage on climate change had a positive effect to types of pro-environmental behaviors (Huang, 2016 and Arlt et al., 2011). In all of these studies, the findings regarding the different forms of media used by an individual indicated that the form of media used had an effect on their climate change awareness.

Research has also shown that Internet and social media environments influence individuals and provide them with information and other personal opinions that lead them to make inferences about climate change. Participants of one study who identified as high users of social technology showed higher levels of concern regarding climate change (Piccolo & Harith, 2015). While social media isn't always the most relied on form of mass media, compared to television and print media, it still influences skepticism towards climate change information.

Media Credibility

Media credibility contributes to the skepticism and uncertainty individuals have towards climate change. When individuals have negative perceptions of the medium's credibility that is being used to communicate climate change information, they report that the evidence for climate change is unreliable and that climate change is not a real problem (Whitmarsh, 2011). Individuals are more skeptical of climate change being a problem when they perceive the media to not be credible. Another study showed how negative perceptions of journalists, lack of confidence in the press, and perceptions of scientists are found with Internet use (Takahashi & Tandoc, 2016). This could be explained by the fact that the Internet and social media offer such a vast amount of information regarding climate change and a wide variety of opinions. As a result of so much information and so many varied opinions being presented, the users of these forms of media might not know who to believe. This same study also found that individuals were more likely to reject climate change content provided in radio formats than in television formats (Takahashi & Tandoc, 2016). Researchers' rationale for this is that the visualizations that television provides are effective at increasing attitudes towards the issue of climate change. With this, it can be said that these visualizations contribute to the media's message credibility.

Another study determined that print media was perceived as the most credible followed by broadcast media then new media (Lee & Cho, 2020). Similar to previous findings, print media and broadcast media are perceived as credible sources, while new

media is perceived to be the least credible. It has also been found that when it comes to scientific news in the media, individuals perceived a source to be more credible when the information aligned with their preexisting beliefs (Martins, Weaver, & Lynch, 2018). When individuals experience conflicting information that did not align with their preexisting beliefs, they were more likely to discredit the source of the information.

As previously stated, media exposure affected an individual's pro-environmental behaviors but it has also been found that media credibility also affects these behaviors. Lee & Cho (2020) found that when an individual had a positive perception of media credibility, he or she is more likely to believe and accept the media's messages regarding climate change, making them more likely to change behaviors in ways that protect the environment.

Broadcast Networks Coverage of Climate Change

It has been shown that cable news stations have significant differences in the ways that they cover climate change. A content analysis was done to 79 Fox News Channel transcripts and 106 CNN transcripts, and after doing this, it was determined that Fox News Channel advocates skepticism towards climate change in more of their shows than CNN does (Hart, 2008). It was found that CNN anchors were more likely to state that global climate change is real and happening and state that there is scientific consensus around the issue; whereas, Fox News Channel anchors were more likely to question whether climate change is really happening, and state that there is scientific uncertainty about the issue (Hart, 2008). With these differences, it is clear that Fox News

Channel advocates skepticism towards climate change and generally offers more conservative coverage than CNN does. It can also be argued that cable news stations report on news in ways that align with their target audience's political orientation.

This was also shown by another study which found that Fox News Channel takes a more dismissive tone towards climate change than CNN or MSNBC does (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012). Evidence from another content analysis showed that Fox News Channel interviews more climate change doubters than believers and that stories were more likely to feature claims that challenged the scientific agreement on climate change, and were least likely to confirm that climate change is happening (Feldman, et al., 2012). The dismissive tone Fox News Channel takes when reporting on climate change is evident by the way it challenges the argument, does not confirm the argument, and features more individuals who are against the argument. Additionally, when looking at the argument that climate change is being caused by human activities, nearly 30% of Fox News Channel broadcasts included statements that said that this is unclear and argued that climate change is caused by natural changes in the environment. Only 3% of CNN broadcasts made such claims and no MSNBC broadcast made no such claims (Feldman, et al., 2012). Making statements suggesting that climate change is naturally occurring in the environment rather than occurring as a result of human activity is an important part in the dismissive tone Fox News Channel takes. In addition to their findings with the content analysis, Feldman, et al. (2012) also analyzed the relationship between viewership of these three channels and their beliefs. The survey's results found that the viewers who identify as Republican are associated with

greater acceptance of climate change. Republicans were also more strongly linked with the news outlet watched, regardless of how well the outlet aligned with their political orientation; whereas, Democrats did not vary much in their beliefs depending on the news outlets viewed (Feldman, et al., 2012). As a group, Republicans tend to be skeptical of climate change, but when exposed to a news outlet covering the issue, they tend to be persuaded of the reality of the issue and become less skeptical, regardless of their political identity. Democrats were found to be unchanged in their beliefs with regards to their cable news viewing.

Theoretical Framework

Cognitive Dissonance

The theory of cognitive dissonance can provide an explanation as to why individuals would be skeptical of climate change and especially that human activity is creating a change and an increase in earth's temperatures. Cognitive dissonance was developed to help explain what happens when individuals experience inconsistencies in their beliefs, attitudes, or actions; these inconsistencies, or dissonances, causes individuals to feel psychologically uncomfortable and motivates them to try to reduce the dissonance and achieve consistency or consonance (Festinger, 1957). If individuals' actions are contradictory to their beliefs, they will experience an unpleasant feeling of dissonance, and they will change their beliefs or actions in order to achieve consistency. The magnitude of the dissonance that an individual could experience depends on the importance of the elements that are in a disagreement with each other (Festinger, 1957).

If individuals hold beliefs that are important to them but their behaviors go against their beliefs, they will likely change their behaviors to match the beliefs that are important to them. There are many different possible scenarios that can cause an individual to experience dissonance between two cognitive elements such as logical inconsistencies, personal opinions, or past experiences (Festinger, 1957). Regardless of the specific scenario that created dissonance between two elements, an individual will be motivated to eliminate the dissonance and achieve consistency.

When applying this to the issue of climate change, it can be said that when individuals are faced with the belief that their actions are causing harmful effects on the earth's temperature, they will experience dissonance and want to achieve consonance either by dismissing the issue or changing their behaviors in ways that are beneficial to the issue. While many individuals are unable to avoid taking harmful actions with the way society is structured, they may adjust their beliefs and self-concepts to be consistent with their actions (Frantz & Mayer, 2009). The production of greenhouse gases is an example of this; many individuals drive gas powered automobiles that are constantly emitting carbon dioxide and other greenhouse gases into the air, creating an increase in earth's temperatures. Many individuals are unable to avoid driving and because of this, instead of trying to drive less and reduce their carbon footprint, individuals will change their beliefs and be more skeptical of climate change being a pressing issue. On the other hand, an individual could change his or her behavior by driving an electric car. Regardless of an individual changing his or her belief or behavior, he or she will still try to reduce dissonance and achieve consistency.

Theory of Reasoned Action

Applying the theory of reasoned action can explain the relationship between individual's attitudes and their behaviors, or specific to this study, the relationship between individual's attitudes towards climate change and their intention to behave in ways that are pro-environment. There are two determinants according to the theory, attitude toward the behavior and subjective norm (Ajzen, 1985). Whether or not an individual has a positive or negative attitude towards performing the behavior and whether or not an individual believes that others will perform the behavior, contribute to individual's behavioral intentions. These behavioral intentions are what controls individual's actions of performing the behavior (Ajzen, 1985). This theory can be applied to the specific pro-environmental behavior of purchasing a stainless-steel water bottle to reduce the use of plastic water bottles. When looking at the first determinate of attitudes, an individual could have a positive attitude towards performing the behavior by knowing they are reducing their plastic consumption. Or, an individual could have a negative attitude if they believe stainless-steel is too expensive. When looking at the second determinate of social norms, an individual could see that others have already performed the behavior, believing it to be the social norm. These two determinates of behavioral intentions will control whether or not an individual performs the behavior and purchases a stainless-steel water bottle.

Based on the research discussed above, this study identified several important concepts necessary to predict who will be a skeptic and who will be a believer in climate

change and to help explain the role of news media consumption. Research shows that a person's gender and political orientation is an important predictor of whether the individual will be a skeptic or believer (Whitmarsh, 2011 and McCright & Dunlap, 2011). The literature also indicates that there are several important characteristics of media consumption that must be assessed to determine media's role in determining who will become a skeptic or believer. The research indicates that media coverage of climate change impacts individual's concerns (Carmichael & Brulle, 2016). Additionally, which type of media an individual uses also impacts concerns (Arlt et al., 2011), as well as perceived credibility of the media (Whitmarsh, 2011). Broadcast networks watched also impacts climate change concerns (Hart, 2008 and Feldman, et al., 2012). Lastly, individuals' climate change concerns affect their behavioral intentions (Shi, et al., 2015).

Current Study

This study poses several research questions, the first analysis of this study seeks to answer this set of research questions. First, the analysis sought to understand the impact of political orientation on one's skepticism or believe in climate change information. It proposed the following hypothesis.

H1: Those who identify as conservative will report greater skepticism towards climate change than those who identify as liberal.

Second based on the research on media effects and audience's reaction to information on climate change, the analysis addressed the following set of questions about the influence of the media.

R1: What is the relationship between (a) entertainment and news media consumption (b) exposure to climate change entertainment and news stories (c) attention given to climate change entertainment and news stories (d) perceived media credibility (e) broadcast network consumption and climate change skepticism/belief?

The literature suggests that skepticism or belief about climate change may be variable by an individual's characteristics. Therefore, the first analysis explored the following question:

R2: What is the relationship between individual's characteristics (a) gender (b) race and climate change skepticism/belief?

Based on the literature reviewed above about people's willingness to adopt positive environmental behaviors, the second analysis of this study seeks to answer this third set of research questions: First, the analysis sought to understand the impact of climate change skepticism, political orientation, and self-reported climate change knowledge on one's willingness to adopt pro-environmental behaviors. It proposed the following hypotheses.

H2: Those who report to be skeptical of climate change will report less willingness to adopt pro-environmental behaviors than those who report to be climate change believers.

H3: Those who identify as conservative will report less willingness to adopt pro-environmental behaviors than those who identify as liberal.

H4: Those who identify as having less self-reported climate change knowledge will report less willingness to adopt pro-environmental behaviors than those who self-report more climate change knowledge.

Again, based on the research on media effects and audience's reaction to information on climate change, the analysis addressed the following set of questions about the influence of the media.

R3: What is the relationship between (a) news media consumption (b) exposure to climate change news stories (c) attention given to climate change news stories and willingness to adopt pro-environmental behaviors?

Finally, this study seeks to answer this last set of research questions about how an individual's characteristics will influence willingness adopt pro-environmental behaviors:

R4: What is the relationship between individual's characteristics (a) gender and (b) race and willingness to adopt pro-environmental behaviors?

Procedures

An online survey was conducted for this study via Qualtrics. Faculty in the communication department were contacted via email and asked to offer their students the opportunity to take the survey and earn five points of extra credit for participating. A total of 15 undergraduate communication classes were recruited, 64.12% of participants were enrolled in Communication 110, Public Speaking. The participants received a link to the online survey from their professors via the University's email or Canvas website. On the first page of the survey website, all participants were given a brief overview of the

study and a statement of informed consent. They were informed that by continuing, they would be giving their informed consent.

After giving their consent, students accessed the study's survey. To protect the respondents' anonymity, the Qualtrics program assigned an identifier to each participant and only this anonymous identifier was linked to participants' responses. Upon completion, the participants were redirected to a separate questionnaire that asked for respondents' name, course, and instructor. The data from the second questionnaire was used to provide instructors with a list of students who had completed the survey so that they could award the extra points.

The questionnaire was comprised of 30 questions, 5 of these were opened-ended questions, the remaining 25 questions were closed-ended using nominal and interval type questions. The questionnaire was primarily used to test whether respondents' media habits influenced their level of skepticism toward climate change information, and whether the level of skepticism influenced their intention to pursue environmentally friendly behaviors. A 23-item scale was used to measure climate change skepticism, and a 24-item scale was used to measure pro-environmental behaviors. There were two questions asked to measure respondent's media consumption for entertainment and news purposes. There were also two questions asked to measure respondent's exposure to climate change news and entertainment stories, and two questions asked to measure how much attention is given to news and entertainment climate change stories. Five questions were asked to measure how credible a media source is perceived by respondents. When asking these questions, there was five different forms of media being questioned each

time, these include: social media, Internet, television, radio, and newspaper. The last question relating to media asked for the number of hours spent viewing different broadcast networks. Finally, one question was asked to measure respondent's self-reported level of climate change knowledge, and; demographic questions of gender, race, and political orientation were asked.

The first analysis undertaken for this study examined the impact of these variables (time spent on media for entertainment and news purposes, exposure to climate change news and entertainment stories, attention given to climate change news and entertainment stories, perceived media credibility, broadcast network consumption, and political orientation, race, and gender) and the relationship they have with climate change skepticism or belief. The second analysis undertaken for this study explored how skepticism or belief affects individual's intentions to behave in ways that are pro-environment. Specifically, the variables being used in this second analysis include: news media consumption, exposure to climate change news stories, attention given to climate change news stories, broadcast network consumption, climate change skepticism and belief, self-reported climate change knowledge, and political orientation, race, and gender

Methods

Participants

A total number of 602 participants completed this study's survey. Participants were undergraduate students at a Midwest university who were recruited by their communication professors. There were 314 men, 279 women, and 9 participants who identified their gender as other. The majority of participants indicated that they were in

their first (29.2%) or second year (33.7%) of school. Over one-fifth (20.6%), indicated they were in their fourth year (see Table 1). Caucasian participants represented the largest racial group (84.6%) followed by those who identified as more than one race (6.5%) (see Table 2). The plurality (18.8%) of participants has a family household income of \$140,000 or above (see Table 3).

Analysis 1

The first analysis included several independent variables. They include political orientation and these media variables: perceived credibility of the media, time spent on the five forms of media for news and entertainment purposes, exposure to news and entertainment content about climate change on the five forms of media, and attention to news and entertainment content about climate change on the five forms of media. Race and gender were also measured. The dependent variables in this first analysis was an assessment of the degree to which respondents were skeptical about climate change and the degree to which respondents were believers in climate change.

Measures

Political Orientation

Two items were used to measure respondents' political orientation, the first item assessed respondents' political orientation on economic issues, and the second item assessed their political orientation for social issues. For each, an 11-point Likert-type scale was used. Researchers' rationale for this wide-range scale was to capture greater

variance. Respondents answered on a scale of -5 to 5. The negative side of the scale ran from “-5” which indicated “very liberal”, to “-1”, which was the lowest scale point for being liberal. The positive side of the scale ran from 1 to 5, which indicated “very conservative”. The “0” scale point indicated that the participant did not identify with either liberal or conservative, and scale point “5” represented that the participant identified as “very conservative” (see Appendix A, Question 15).

Time Spent on Media

Open-ended questions were used to measure the number of minutes per day participants spent on five different forms of media: social media, Internet, television, radio, and newspaper. Respondents were asked to indicate how much time they spent on each form of media for entertainment purposes and how much time they spent on each media for news information. Thus, the number of minutes per day participants spend on media forms for entertainment purposes was measured separately from the number of minutes per day participants spend on media forms for news purposes. In total, 10 items were used (see Appendix A, Questions 1 & 2).

Exposure to Climate Change Stories

Respondents were asked to estimate the amount of news content about climate change that they see in each of the five forms of media (social media, Internet, television, radio, and newspapers). They also were asked to estimate the amount of content about climate change that they see in entertainment content in each of the five forms of media.

As a result, there were 10 “exposure to climate change” variables: five for news content about climate change and five for entertainment content about climate change.

Respondents were asked to estimate the amount of stories they see about climate change.

Respondents answered on a scale of 0 to 5 scale in which a “1” indicated that the respondents saw “very little” climate change content in a particular form of media and “5” indicated respondents saw “a great deal” of content about climate change in a particular form of media. The “0” indicated that the respondent did not use a particular form of media (see Appendix A, Questions 8 & 9).

Attention to Climate Change Stories

Respondents were asked to estimate how much attention they pay to news content about climate change in each of the five forms of media. They were also asked to estimate how much attention they pay to entertainment content about climate change in each of five media. The results were 10 “attention to content variables”: five for news content on each form of media and five for entertainment content on each of the forms of media. Respondents answered on a scale of 0 to 5 scale in which a “1” indicated that the respondents paid “very little attention” to climate change content in a particular form of media and “5” indicated respondents paid “a great deal” of attention to climate change content in a particular form of media. The “0” indicated that the respondent did not use a particular form of media (see Appendix A, Questions 12 & 13).

Television Network Reliance

The questionnaire included items to determine which television networks respondents rely on for news by asking them how much time they spent watching each of several different networks. Respondents were asked to estimate the amount of time they spent viewing ABC, NBC, CBS, Fox, Fox News, MSNBC, CNN, and “other news providers”. Respondents answered on a 12-point scale, which increased in half-hour increments from “0” to “5-and-one-half or more hours” (see Appendix A, Question 14).

Media Credibility

Respondents were asked to assess the credibility of a generic source that typically is encountered in each of the five forms of the media. Smith (2005) explained that media consumers assess the credibility of sources on five dimensions: expertise, competence, honesty, goodwill, and overall credibility. For each of the five forms of media, respondents were asked to indicate the degree to which the generic source possessed each of the dimensions of credibility. Respondents answered on a 7-point scale in which “1” indicated that the source did not possess a particular dimension of credibility and “7” indicated that the source did. Therefore, five credibility questions were asked for a generic source appearing in each of the five forms of media resulting in a total of 25 credibility items” (see Appendix A, Questions 3, 4, 5, 6, & 7).

A data-reduction procedure was used to reduce the 25-item credibility scale to its constituent dimensions. A factor analysis of 25 items was carried out using Principal Component extraction and Varimax rotation (See Table 4). The resulting solution yielded 5 factors. The expertise, competence, honesty, goodwill, and overall credibility

variables for social media loaded on the first factor (Cronbach's Alpha = .92). The expertise, competence, honesty, goodwill, and overall credibility variables for Internet media loaded on the second factor (Cronbach's Alpha = .92). The expertise, competence, honesty, goodwill, and overall credibility variables for television loaded on the third factor (Cronbach's Alpha = .93). The expertise, competence, honesty, goodwill, and overall credibility variables for radio loaded on the fourth factor (Cronbach's Alpha = .95). The expertise, competence, honesty, goodwill, and overall credibility variables for newspaper loaded on the fifth factor (Cronbach's Alpha = .96). A composite variable was created for each of the factors that emerged by adding together the original items that loaded strongly on each factor and dividing the total by the number of items added.

In addition to these predictor variables, two demographic variables of race and gender were included in the analysis. Race was a nominal item with seven categories (Hispanic or Latino, Black or African American, Native American or American Indian, Asian or Pacific Islander, White, Other, and more than one race) (see Appendix A, Question 25). Respondents chose the category with which they most identified. Gender was a nominal item with four categories (male, female, transgender and other) (see Appendix A, Question 26). Respondents were instructed to indicate which category they most identified with. For the final analyses, dummy variables for the four gender categories and seven race categories were created, totaling eleven new dummy variables.

Dependent Variables

Climate Change Skepticism and Beliefs

The dependent variables for the first analysis was skepticism or belief in climate change. This study utilized Whitmarsh's (2011) 23-item climate change skepticism scale. Although Whitmarsh used a 5-point Likert-type scale, an 11-point scale was used in this study to measure the participant's skepticism or belief towards climate change. Respondents were asked whether they agreed or disagree with 23 items about climate change information. The scale ranged from "-5" to "5". The negative side of the scale ran from "-5" which indicated "strongly disagree", to "-1", which was the lowest scale point for disagree. The positive side of the scale ran from "1" to "5". A "5" indicated "strong agree". The "0" scale point indicated that the respondent neither agreed or disagreed with a statement (see Appendix A, Question 16).

Three new variables were created from the responses to these 23 items. For some of the items, agreement indicated that the respondent was skeptical about climate change and disagreement indicated the respondent believed climate change. For other items, the reverse was true. Those who chose neutral to any item was neither a skeptic of a believer. Each of the items were recoded. For the "skepticism" version of the items, the responses of all of those who chose the skepticism side of the scale had remained on the original five-point scale. The responses of those who chose the neutral or the belief side of the scale were coded as "0". To create the "belief" version of the items, the responses of all of those who chose the belief side of the scale remained on the original five-point scale. The responses of those who chose the neutral or the skepticism side of the scale were code as "0". Any of the resulting variables with negative five-pint scales were converted to positive five-pint scales. Finally, to create the "neutral party" variable,

responses to the 23 were recoded with a “1” for those who chose “neutral” and all others were recoded as “0”. The result was 69 new items, 23 which measured the degree to which an individual was skeptical about climate change, 23 which measured the degree to which the individual believed climate change and 23 which indicated who was neutral and who was not neutral on climate change.

To reduce the 23-item skepticism scale and 23-item belief scales to their underlying constituent dimensions, each set of items was submitted to a factor analysis using Principal Component extractions and Varimax rotation (see Tables 5 and 6). The factor analysis of the skepticism scale items yielded three dimensions of climate change skepticism. The first component of climate change skepticism was comprised of items relating to the rejection of what the evidence for climate change looks like (Cronbach’s Alpha =.86), and the second component of climate change skepticism was comprised of items relating to the lack of emotional response to climate change and the rejection of consequences (Cronbach’s Alpha =.81). The third component of climate change skepticism was comprised of two items relating to the issue being beyond the person’s ability to understand the complexities of the issue (Cronbach’s Alpha =.58). The factor analyses of the climate change belief scale items yielded three factors that were similar to the three skepticism items. The first component of climate change belief was the acceptance of the evidence for climate change (Cronbach’s Alpha = .96). The second factor of climate change belief was having an emotional response to the consequences of climate change (Cronbach’s Alpha =.90). The third component of climate change belief was comprised of same two items’ counterparts relating to the person’s ability to

understand the issue (Cronbach's Alpha =.62). Three agree items and their disagree counterparts that didn't load well on any factor were dropped and included as individual items in the final analyses used to answer the research questions.

A composite variable was created for each of the factors that emerged by adding together the original items that loaded strongly on each factor and dividing the total by the number of items added. The three new skepticism variables being: Rejecting Evidence, Lacking Emotions, and Beyond Understanding. The three new belief variables being: Accepting Evidence, Emotionally Responding, and Within Understanding.

Whitmarsh (2011) factor analyzed all 23 items for her study. Her factor analyses yielded four factors; the first relating to the skepticism and uncertainty towards climate change, the second component represented the emotional and moral dimensions of climate change, the third component related to the disinterest in climate change, and the need for information made up the fourth component. Whitmarsh's first three factors are similar to three factors found by this study's analyses.

Analysis 2

The second analysis examined whether skepticism or belief in climate change influenced respondents' willingness to pursue environmentally friendly behaviors.

Independent Variables

The independent variables for the second analysis included gender, race, political orientation, time spent on the five forms of media, exposure to climate change news

content, attention to climate change news content described above. In addition, the climate change skepticism and belief variables described above were used. A new independent variable was also added to the second analysis as a predictor of willingness to adopt environmentally friendly behaviors, this being self-reported climate change knowledge.

Self-reported Climate Change Knowledge

Respondents' perceived knowledge of climate change was included as an independent variable in the second analysis. Respondents were asked to estimate their knowledge about climate change on an 11-point scale from "0" to "10" in which "0" indicated "not at all knowledgeable" and "10" was "very knowledgeable" (see Appendix A, Question 21).

Dependent Variables

Pro-Environmental Behaviors

The dependent variable for the second analysis was an assessment of respondents' willingness to adopt environmentally friendly behaviors. The study utilized Whitmarsh & O'Neill's (2010) 24-item PEB (pro-environmental behavior) scale to measure participant's pro-environmental behaviors. Seven of the items asked respondents if they pursued behaviors that would not commonly be applicable to college students, for example, an item asked if respondents would insulate their homes. In order to better fit the lifestyle of college students, slight alterations were made to the wording of the

original scale to ask respondents if they would be willing to pursue the behavior at some time in the future (see Appendix A, Questions 17 & 18). For example, instead of asking if participants did take a certain action as a homeowner, participants were asked if they *would* take said action at some point in the future when they owned a home.

Respondents answered on an 8-point scale of 0 to 7 in which “0” indicated that the respondent was “not at all willing” to take action, “6” indicated that the respondent was “very willing” to take action, and “7” indicated that the respondent “already took action”.

The remaining 17 items were used as originally written by Whitmarsh and O’Neill.

Respondents answered on a four-point scale for which “0” indicated that the participant has “never” followed the pro-environmental action and “3” that the respondent “always” pursued the action. The 24 items were converted to a standardized answer scale as described below.

The 24-item PEB scale was reduced to its underlying constituent dimensions to create more parsimonious analyses. The 24 PEB items were submitted to an exploratory factor analysis using Principal Component extraction and Varimax rotation. The factor analysis of these items revealed four dimensions (6 items that did not load well on any factor were dropped and used as individual items in the analyses) (see Table 7). The first factor was primarily comprised of energy-saving items (Cronbach’s alpha = .87). The second pro-environmental behavior factor was primarily comprised of shopping behaviors that are low-waste (Cronbach’s alpha = .71). Ways of reducing the environmental impact created by transportation made up the third factor (Cronbach’s alpha = .60). Only two items, recycling and turning off lights, comprised the fourth and

final factor (Cronbach's alpha = .55). This four-factor solution of the pro-environmental behaviors was shown to have external validity it was similar to a factor analysis generated by Whitmarsh & O'Neill (2010) in their original study. They found four behavioral factors: energy/water use, waste behavior, transportation, and eco-friendly shopping.

A composite variable was created for each of the factors that emerged by adding together the original items that loaded strongly on each factor and dividing the total by the number of items added. The four new pro-environmental behavior variables being: Energy-Saving Behaviors, Low-Waste Shopping Behaviors, Low-Impact Transportation Behaviors, and Habitual Behaviors.

Standardization of scales

Because different scales were used for different items on the questionnaire, all of the items from the questionnaire were standardized by converting them to a 100-point percentage scale. For example, a respondent who answered a 5 on a 10-point scale would be rescored a 50 on the 100-point percentage scale. A respondent who answered a 3 on a six-point scale would also receive a 50 on the 100-point percentage scale. The items used in the above-mentioned factor analyses had had their response scales standardize before the factor analyses were carried out.

Results

Descriptive Statistics

Descriptive analyses were conducted using the nine variables (political orientation, time spent on media, media credibility, exposure to climate change stories, attention given to stories, self-reported knowledge, broadcast networks, climate change skepticism, and pro-environmental behaviors). Being conservative on economic issues had the highest average score ($M = 1.32$, $SD = 1.76$) (see Table 8). When looking at the number of minutes spent on the five forms of media for entertainment and news use, entertainment minutes had the highest average scores for social media, Internet, television, radio, but not newspaper (see Table 9). In terms of media credibility, survey respondents exhibited a middle level of credibility across the five forms (see Table 10). Averages for exposure to climate change news stories were higher than exposure to entertainment stories (see Table 11). This was also true with the attention given to climate change stories (see Table 12). In terms of self-reported climate change knowledge, survey respondents exhibited a middle level of knowledge (see Table 13). When looking at broadcast networks, the minutes spent on Fox News had the highest average ($M = .51$, $SD = .77$); followed by CNN and “Other” (see Table 14). When observing the skepticism and belief scores, the average scores for believers were higher on the scale items than the average score for the skeptics (see Tables 15 and 16). Lastly, in terms of pro-environmental behaviors, survey respondents primarily exhibited a middle level of willingness to behave in ways that are pro-environmental (see Tables 17 and 18).

Analysis 1

In order to prove H1 and answer research questions R1a – R1e and R2a – R2b; six hierarchy multiple regressions were conducted with each with one of the three skepticism and the three belief variables as the dependent variable (see Tables 19 and 20). These multiple regression tests utilized five blocks of dependent variables. Demographic information of gender, race, and political orientation were entered into the first block. The dummy variables for gender and race were used, female was the comparison dummy variable that was left out for gender, and white was the comparison dummy variable left out for race. Media consumption for entertainment and news purposes was entered into the second block. Exposure and attention variables were entered into the third block. Specifically, how often climate change entertainment and news stories are seen in the five forms of media and how much attention is given to stories. The number of minutes spent with broadcast networks were entered into the fourth block, and the source credibility of the five forms of media was entered into the fifth block.

The ANOVA for the multiple regression model that used skepticism by Rejecting Evidence as the dependent variable was significant ($p = .001$), and the ANOVA for the multiple regression model that used skepticism by Lacking Emotions as dependent variables was significant ($p = .001$). However, an ANOVA of the multiple regression with the skepticism by Beyond Understanding as the dependent variable was not significant ($p = 1.09$) (see Table 19). ANOVAs of the three multiple regression models with the three belief variables (Accepting Evidence, Emotionally Responding, and Within Understanding) as the dependent variables all were significant ($p = .001$) (see Table 20).

Six additional multiple regression analyses were conducted; each used one of the items that had been eliminated from the factor analyses as the dependent variable. These same five blocks of independent variables were also used in the multiple regressions conducted with the remaining skepticism/belief-scale items that were dropped from the factor analysis. Specifically, these independent variables include: Agreeing and Disagreeing That Talking About Climate Change Is Boring, Agreeing and Disagreeing That the Respondent Often Talks About Climate Change, and Agreeing and Disagreeing That It Is Difficult to Know Which Products Are Better for the Environment.

The ANOVA of the multiple regression model with Agreeing That Talking About Climate Change Is Boring was significant ($p = .001$) (see Table 21), and the ANOVA of the multiple regression model with Disagreeing That Talking About Climate Change Is Boring as the dependent variables was significant ($p = .001$) (see Table 21). An ANOVA of the multiple regression model with Agreeing That the Respondent Often Talks About Climate Change as the dependent variable was significant ($p = .001$) (see Table 22). An ANOVA of the multiple regression model with Disagreeing That the Respondent Often Talks About Climate Change as the dependent variable was significant ($p = .001$) (see Table 22). However, an ANOVA of the multiple regression model with Agreeing That It Is Difficult to Know Which Products are Better for the Environment was not significant ($p = .102$), and an ANOVA of the multiple regression model with Disagreeing That it is Difficult to Know Which Products are Better for the Environment was not significant ($p = .169$) (see Table 23).

Analysis 1 Results

With these multiple regression results, the first set of research questions can be answered. In response to H1 (those who identify as conservative will report greater skepticism towards climate change than those who identify as liberal) limited support was found for the hypothesis (see Tables 19 – 23). Identifying as conservative on social issues made people more likely to Reject Evidence ($\beta = .22, p = .001$). This was also found with identifying as conservative on economic issues ($\beta = .20, p = .001$). Identifying as conservative on economic issues also meant that people were more likely to Lack an Emotional Response to climate change ($\beta = .17, p = .01$). Identifying as liberal on social issues meant that people were more likely to Accept Evidence ($\beta = .29, p = .001$). Identifying as liberal on social issues also meant that people were more likely to Emotionally Respond to climate change ($\beta = .20, p = .001$), yet this was also true of identifying as conservative on social issues ($\beta = .11, p = .05$). In addition, identifying as liberal on social issues meant that people were more likely to believe that climate change was Within Understanding ($\beta = .14, p = .05$). This was also true of identifying as conservative on social issues ($\beta = .12, p = .001$). Lastly, identifying as liberal on economic issues also meant that people were more likely to believe that climate change was Within Understanding ($\beta = .16, p = .02$).

Political orientation also had many significant relationships with the skeptic and belief items that didn't load in the factor analysis. Identifying as conservative on social issues meant that people were more likely to Agree That Talking About Climate Change is Boring ($\beta = .19, p = 0.003$). In contrast, identifying as liberal on social issues meant

that people were more likely to Disagree That Talking About Climate Change is Boring ($\beta = .15, p = .02$). This was also found with identifying as liberal on economic issues ($\beta = .14, p = .03$). Identifying as conservative on social issues meant that people were more likely to Disagree with Often Talking About Climate Change ($\beta = .16, p = .01$).

Whereas, identifying as liberal on social issues meant that people were more likely to Agree with Often Talking About Climate Change ($\beta = .18, p = .01$).

In response to R1a (what is the relationship between entertainment and news media consumption and climate change skepticism/belief?) limited support for the relationships was found. With the more newspaper consumption for news purposes, meant that people more likely to Emotionally Respond to climate change ($\beta = .10, p = .04$). Lastly, when looking at news media consumption with the skeptic and belief items that didn't load in the factor analysis, the more radio consumption for news purposes meant that people were more likely to Disagree That Talking About Climate Change is Boring ($\beta = .10, p = .02$). With the more Internet consumption for entertainment purposes, meant that people more likely to Lack an Emotional Response ($\beta = .13, p = .02$). Finally, the more television consumption for entertainment purposes, meant that people were less likely to Disagree with Often Talking About Climate Change ($\beta = -.08, p = .04$).

In response to R1b (what is the relationship between exposure to climate change entertainment and news stories and climate change skepticism/belief?) limited support was found for the relationships. Being exposed to climate change news stories on the television meant that people were less likely to Accept Evidence ($\beta = -.14, p = .01$).

Similarly, being exposed to climate change news stories on the television also meant that people were less likely to Emotionally Respond ($\beta = -.13, p = .02$). On the other hand, being exposed to climate change news stories on the radio meant that people were more likely to Emotionally Respond ($\beta = .15, p = .01$).

Exposure to climate change news stories also had many significant relationships with the skeptic and belief items that didn't load in the factor analysis. Being exposed to news stories on the television meant that people were less likely to Disagree That Talking About Climate Change is Boring ($\beta = -.12, p = .03$). Again, when looking at being exposed to news stories on the television, people were more likely to Disagree with Often Talking About Climate Change ($\beta = .12, p = .05$). In contrast, being exposed to climate change news stories on the radio, meant that people were less likely to Disagree with Often Talking About Climate Change ($\beta = -.14, p = .03$). Lastly, being exposed to news stories on social media meant that people were more likely to Agree with Often Talking About Climate Change ($\beta = .15, p = .02$). Lastly, being exposed to climate change entertainment stories on the television meant that people were more likely to Reject Evidence ($\beta = .12, p = .05$). This same relationship was also found with radio ($\beta = .15, p = .04$). Finally, being exposed to climate change entertainment stories with newspaper, meant that people were less likely to Agree with Often Talking About Climate Change ($\beta = -.16, p = .03$).

In response to R1c (what is the relationship between attention given to climate change entertainment and news stories and climate change skepticism/belief?) limited support for the relationships was found. The more attention paid to climate change news

stories on the Internet meant that people were more likely to Emotionally Respond ($\beta = .16, p = .03$). Paying attention to climate change news stories also had many significant relationships with the skeptic and belief items that didn't load in the factor analysis. The more attention paid to these stories on the Internet, meant that people were less likely to Agree That Talking About Climate Change is Boring ($\beta = -.18, p = .02$). Similarly, the more attention paid to news stories on the Internet, also meant that people were more likely to Disagree That Talking About Climate Change is Boring ($\beta = .18, p = .01$). Again, with paying attention to climate change news stories on the Internet, meant that people were more likely to Agree with Often Talking About Climate Change ($\beta = .21, p = .01$). The more attention paid to news stories on the radio meant that people were less likely to Disagree with Often Talking About Climate Change ($\beta = -.15, p = .05$). When looking at entertainment stories, the more attention given to these stories in the newspaper meant that people were more likely to Reject Evidence ($\beta = .16, p = .05$). Additionally, the more attention given to entertainment stories in social media meant that people were less likely to Disagree with Often Talking About Climate Change ($\beta = -.17, p = .04$).

In response to R1d (what is the relationship between perceived media credibility and climate change skepticism/belief?) limited support was found to explain the relationship. The more credible an Internet source is perceived as, the less likely people were to Emotionally Respond ($\beta = -.12, p = .01$). In addition, the more credible a newspaper source is perceived as, the more likely people were to Accept Evidence ($\beta = .13, p = .004$). This same relationship also found with Emotionally Responding ($\beta = .10,$

$p = .04$), and with believing that climate change is Within Understanding ($\beta = .13, p = .01$).

Media credibility also had many significant relationships with the skeptic and belief items that didn't load in the factor analysis. The more credible a newspaper source is perceived as, people were more likely to Agree That Talking About Climate Change is Boring ($\beta = .10, p = .05$). This same relationship was also found with social media credibility ($\beta = .11, p = .01$). Lastly, when looking at social media credibility, the more credible the source is perceived as, the more likely people were to Disagree with Often Talking About Climate Change ($\beta = .14, p = .001$).

In response to R1e (what is the relationship between broadcast network consumption and climate change skepticism/belief?) some support was found to explain the relationship. The more consumption of "other" broadcast networks meant that people were more likely to Reject Evidence ($\beta = .11, p = .01$). Similarly, the more consumption of "other" broadcast networks meant that people were less likely to Accept Evidence ($\beta = -.08, p = .047$). This was also found with Fox Network ($\beta = -.12, p = .01$) and Fox News ($\beta = -.10, p = .04$). Whereas, the more consumption of MSNBC meant that people were more likely to Accept Evidence ($\beta = .10, p = .03$). In addition, the more consumption of ABC meant that people were less likely to Emotionally Respond ($\beta = -.10, p = .04$). Lastly, with the more Fox News consumption, meant that people were less likely to Disagree That Talking About Climate Change is Boring ($\beta = -.12, p = .02$).

In response to R2a (what is the relationship between gender and climate change skepticism/belief?) limited support was found. Males were less likely than females to

Accept Evidence ($\beta = -.08, p = .04$). Males were also less likely than females to Emotionally Respond ($\beta = -.08, p = .05$). When looking at the climate change skepticism/belief variables that didn't load in the factor analysis, males were less likely to Disagree That Talking About Climate Change is Boring ($\beta = -.13, p = .001$). Similarly, males were less likely than females to Disagree with Often Talking About Climate Change ($\beta = -.09, p = .04$).

In response to R2b (what is the relationship between race and climate change skepticism/belief?) limited support was found. Identifying as Hispanic or Latino meant that they were less likely to Reject Evidence ($\beta = -.09, p = .02$). When looking at the climate change skepticism/belief variables that didn't load in the factor analysis, identifying as Hispanic or Latino also meant that they were less likely to Agree That Talking About Climate Change is Boring ($\beta = -.11, p = .01$). Lastly, identifying as Hispanic or Latino meant that they were less likely to Disagree with Often Talking About Climate Change ($\beta = -.08, p = .03$).

Analysis 2

In order to prove H2 – H4 and answer research questions R3a – R3c and R4a – R4b; four hierarchy multiple regressions were conducted, each with one of the four pro-environmental behavior variables as the dependent variable. These multiple regression tests utilized four blocks of dependent variables that were similar to the skeptic and belief multiple regression. However, when looking at behaviors, only news media use was used as independent variables rather than both news and entertainment purposes. Researchers'

rational for this was the idea that news content would provide more information than entertainment content. Demographic information of gender, race, and political orientation was entered into the first block. Again, the dummy variables for gender and race were used with female being the comparison dummy variable that was left out for gender, and white was the comparison dummy variable left out for race. The number of minutes spent on the five forms of media for news purposes was entered into the second block, in addition to how often climate change news stories are seen in the five forms of media and how much attention is given to climate change news stories. In the third block, the six skepticism and belief variables were entered and in the fourth block, the three skepticism and the three belief items that didn't load on any components were entered.

An ANOVA of each of the four multiple regression models with pro-environmental behavior variables of Energy-Saving Behaviors, Low-Waste Shopping Behaviors, Low-Impact Transportation Behaviors, and Habitual Behaviors all showed to be significant ($p = .001$) (see Tables 24 and 25).

Six additional hierarchical multiple regressions were conducted. For each, one of the items that had been dropped from the factor analyses (Driving Economically, Reuse or Repair Items, Compost Kitchen Waste, Turn Off Water While Brushing Teeth, Write Letters to Politicians, and Protest Environmental Issues) was used as the dependent variable. These same four blocks of independent variables as used in the analyses described above were also used in these regressions.

An ANOVA of the multiple regression model with Driving Economically showed to be significant ($p = .001$) (see Table 26). An ANOVA of the multiple regression model with Reusing or Repairing Items showed to be significant ($p = .001$) (see Table 27). An ANOVA of the multiple regression model with Composting Kitchen Waste showed to be significant ($p = .003$) (see Table 28). An ANOVA of the multiple regression model with Turning Off Water While Brushing Teeth showed to be significant ($p = .001$) (see Table 29). Lastly, an ANOVA of the multiple regression models with Writing Letters to Politicians and Protesting Environmental Issues, both showed to be significant ($p = .001$) (see Tables 30 and 31).

Analysis 2 Results

With these multiple regression results, the second set of research questions can be answered. In response to H2 (those who report to be skeptical of climate change will report less willingness to adopt pro-environmental behaviors than those who report to be climate change believers) limited support was found for the hypothesis (see Tables 24 – 31). With the more belief in climate change by Emotionally Responding, people were more likely to adopt Low-Waste Shopping Behaviors ($\beta = .21, p = .003$). However, the opposite relationship was found with believing that climate change is Within Understanding ($\beta = -.11, p = .04$). Lastly, with the more belief by Accepting Evidence, meant that people were more likely to adopt Habitual Behaviors ($\beta = .20, p = .02$).

The skepticism and belief towards climate change variables also had many significant relationships with the PEB items that didn't load in the factor analysis, with

the more Accepting Evidence, people were less likely to Protest Environmental Issues ($\beta = -.17, p = .02$). However, with more Emotionally Responding to climate change, people were more likely to Write Letters to Politicians ($\beta = .18, p = .02$). Similar to this, with more Emotionally Responding to climate change, people were more likely to Drive Economically ($\beta = .17, p = .02$).

The remaining skepticism and belief variables that didn't load in the factor analysis also had many significant relationships with the PEB variables. With the more Agreeing That Talking About Climate Change is Boring, people were less likely to behave in ways that are Energy-Saving ($\beta = -.09, p = .05$). Going along with this, Disagreeing That Talking About Climate Change is Boring, meant that people were more likely to behave in ways that are Energy-Saving ($\beta = .12, p = .05$). With the more Agreeing with Often Talking About Climate Change, people were more likely to take on Low-Waste Shopping Behaviors ($\beta = -.11, p = .04$). With the more Agreeing with Often Talking About Climate Change also meant that people were more likely to behave in Low-Impact Transportation Behaviors ($\beta = .11, p = .04$). However, with the more Disagreeing with Often Talking About Climate Change, people were more likely to adopt Habitual Behaviors ($\beta = .13, p = .02$).

Finally, the skepticism and belief variables that didn't load in the factor analysis also had many significant relationships with the PEB items that didn't load in their factor analysis. With the more Agreeing with Often Talking About Climate Change, people were more likely to Protest Environmental Issues ($\beta = .24, p = .001$). Similarly, Agreeing with Often Talking About Climate Change meant that people were more likely Write

Letters to Politicians ($\beta = .15, p = .004$). Whereas, with the more Disagreeing with Often Talking About Climate Change, people were still more likely to Turning Off Water When Brushing Teeth ($\beta = .12, p = .03$).

In response to H3 (those who identify as conservative will report less willingness to adopt pro-environmental behaviors than those who identify as liberal) some support for the hypothesis was found. Identifying as conservative on economic issues meant that people were less likely to take on Low-Waste Shopping Behaviors ($\beta = -.12, p = .03$). Identifying as conservative on economic issues also meant that people were less likely to take on Low-Impact Transportation Behaviors ($\beta = -.16, p = .01$). Political orientation also had many significant relationships with the PEB items that didn't load in the factor analysis, identifying as conservative on economic issues meant that people were less likely to Reuse or Repair Items ($\beta = -.13, p = .05$). Identifying as liberal on social issues meant that people were less likely to Compost Kitchen Waste ($\beta = -.15, p = .05$). Identifying as liberal on social issues also meant that people were less likely to Write Letters to Politicians ($\beta = -.14, p = .04$). However, identifying as liberal on economic issues meant that people were more likely to Write Letters to Politicians ($\beta = .20, p = .002$). Lastly, identifying as liberal on economic issues meant that people were more likely to Protest Environmental Issues ($\beta = .17, p = .01$).

In response to H4 (those who identify as having less self-reported climate change knowledge will report less willingness to adopt pro-environmental behaviors than those who self-report more climate change knowledge) support was found for the hypothesis. The more self-reported climate change knowledge, the more likely people were to behave

in ways that are Energy-Saving ($\beta = .20, p = .001$). This same relationship was also found with Low-Waste Shopping Behaviors ($\beta = .19, p = .001$). Again, this relationship was found with Low-Impact Transportation Behaviors ($\beta = .14, p = .01$). Self-reported climate change knowledge also had many significant relationships with the PEB items that didn't load in the factor analysis, the more self-reported knowledge, the more likely people were to Drive Economically ($\beta = .25, p = .001$). This was also found with Reusing or Repairing Items ($\beta = .14, p = .01$), Composting Kitchen Waste ($\beta = .14, p = .01$), and Protesting Environmental Issues ($\beta = .15, p = .002$).

In response to R3a (what is the relationship between news media consumption and willingness to adopt pro-environmental behaviors?) limited support was found only with the PEB items that didn't load in the factor analysis. The more social media consumption for news purposes meant that people were less likely to Compost Kitchen Waste ($\beta = -.10, p = .04$). This same relationship was also found with Turning Off Water When Brushing Teeth ($\beta = -.12, p = .02$) and Protesting Environmental Issues ($\beta = -.09, p = .04$).

In response to R3b (what is the relationship between exposure to climate change news stories and willingness to adopt pro-environmental behaviors?) again, limited support was found only with the PEB items that didn't load in the factor analysis. The more exposure to climate change news stories on the Internet meant that people were more likely to Drive Economically ($\beta = .13, p = .03$). However, the more exposure to news stories in the newspaper, meant that people were less likely to Drive Economically ($\beta = -.14, p = .02$). In addition, the more exposure to news stories on the radio meant that

people were more likely to Compost Kitchen Waste ($\beta = .13, p = .04$). Going along with this, the more exposure to news stories on the radio meant that people were more likely to Write Letters to Politicians ($\beta = .19, p = .001$). The more exposure to news stories on the radio also meant that people were more likely to Protest Environmental Issues ($\beta = .17, p = .003$). Lastly, the more exposure to news stories on social media meant that people were more likely to Turn Off Water When Brushing Teeth ($\beta = .12, p = .05$).

In response to R3c (what is the relationship between attention given to climate change news stories and willingness to adopt pro-environmental behaviors) again, limited support was found only with the PEB items that didn't load in the factor analysis. The more attention paid to news stories on the radio meant that people were more likely to Reuse or Repair Items ($\beta = .17, p = .01$). Additionally, the more attention paid to climate change news stories in the newspaper meant that people were more likely to Write Letters to Politicians ($\beta = .12, p = .04$). This same relationship was also found with Protesting Environmental Issues ($\beta = .16, p = .01$).

In response to R4a (what is the relationship between gender and willingness to adopt pro-environmental behaviors?) limited support was found for the relationship. Males were less likely than females to behave in Low-Waste Shopping Behaviors ($\beta = -.14, p = .001$). Identifying as "other" gender meant that people were more likely to take on Low-Impact Transportation Behaviors ($\beta = .09, p = .03$). Additionally, identifying as "other" gender meant that people were more likely to Write Letters to Politicians ($\beta = .12, p = .002$).

In response to R4b (what is the relationship between race and willingness to adopt pro-environmental behaviors?) limited support was found. Identifying as “other” race meant that people were less likely to adopt Habitual Behaviors ($\beta = -.11, p = .01$). Whereas, identifying as “other” race meant that they were more likely to Write Letters to Politicians ($\beta = .10, p = .01$). This same relationship was also found with Protesting Environmental Issues ($\beta = .14, p = .001$). Identifying as Native American meant that individuals were less likely to Protest Environmental issues ($\beta = -.08, p = .03$). Lastly, identifying as Hispanic or Latino meant that individuals were more likely to Compost Kitchen Waste ($\beta = .12, p = .01$).

Discussion

Climate Change Skepticism/Belief

The Role of Political Orientation

Consistent with previous findings, identifying as conservative meant that people were more skeptical of climate change than those who identified as liberal. Specifically, identifying as conservative on social issues meant that people were more likely to Reject Evidence, while identifying as liberal on social issues meant that people were more likely to Accept Evidence. However, many inconsistent findings with political orientation was also found. Identifying as liberal on social issues also meant that people were more likely to Emotionally Respond to climate change, yet this was also true of identifying as conservative on social issues. Similarly, identifying as liberal on social issues meant that people were more likely to believe that climate change was Within Understanding, yet

again this was also true of identifying as conservative on social issues. Finally, identifying as liberal on economic issues meant that people were more likely to believe that climate change was Within Understanding. With these inconsistencies, it could be argued that the measure used is too broad. Individual's political orientation is dependent on specific issues, so although they identify as conservative on social issues, there could be specific social issues that they would identify as liberal on.

The Role of News Media Consumption

News media consumption had limited impact on whether or not individuals were skeptical of climate change. While social media, television, and Internet news media consumption was not significant, newspaper and radio were. With the more news consumption via newspaper, people were more likely to Emotionally Respond. An explanation for this could be the fact that newspaper is an active medium that requires the individual to be more involved with it by reading, by reading, they are evoking a greater emotional response. With the more news consumption via radio, people were more likely to Disagree That Talking About Climate Change is Boring. This could be explained through the idea that by listening to climate change, people perceive it to be a lively topic and are more willing to continue the conversation. With both of these findings, it can be argued that with the more news media consumption with newspaper and radio, people were less skeptical of climate change.

The Role of Entertainment Media Consumption

Entertainment media consumption also had limited impact on whether or not individuals were skeptical of climate change. While social media, radio, and newspaper entertainment consumption was not significant, Internet and television were. With the more Internet consumption for entertainment purposes, people were more likely to Lack an Emotional Response to climate change. With the more television consumption for entertainment purposes, people were less likely to Disagree with Often Talking About Climate Change. Contrary to the findings with news media consumption, it can be argued that with the more entertainment media consumption with Internet and television, people were more skeptical of climate change. Since entertainment media is used to entertain people, it isn't expected to be an accurate representation of reality and because of this, people are not taking to heart the things that are being communicated.

The Role of Exposure to Climate Change News Stories

Exposure to climate change news stories had limited impact on whether or not individuals were skeptical of climate change. Being exposed to climate change news stories via the Internet and newspaper was not significant while television, social media, and radio were. Being exposed to news stories via television meant that people were less likely to Accept Evidence and less likely to Emotionally Respond, while radio news stories exposure meant that people were more likely to Emotionally Respond. Being exposed to news stories via television also meant that people were less likely to Disagree That Talking about Climate Change is Boring and more likely to Disagree with Often Talking About Climate Change, while radio news stories exposure meant that people

were less likely to Disagree with Often Talking About Climate Change. Depending on what television network individuals are being exposed to, could make them more skeptical of climate change, making the individual wanting to often talk about their skepticism, not thinking it is boring. This could also be said of radio however, radio made individuals less skeptical and less likely to Disagree with Often Talking About Climate Change. This could be due to the vivid presentation television provides unlike radio can. Finally, social media news stories meant that people were more likely to Agree with Often Talking About Climate Change, this could be due to social media being a platform used for communicating opinions.

The Role of Exposure to Climate Change Entertainment Stories

Exposure to climate change entertainment stories also had limited impact on whether or not individuals were skeptical of climate change. Being exposed to climate change entertainment stories via the Internet and social media was not significant, television, radio and newspaper were. Being exposed to climate change entertainment stories on the television and radio meant that people were more likely to Reject Evidence. With climate change evidence being communicated as a form of entertainment, it is understood why individuals would be more skeptical of it.

The Role of Attention Given to Climate Change News Stories

Attention to climate change news stories had limited impact on whether or not individuals were skeptical of climate change. Attention given to climate change news

stories on social media, television, and newspaper was not significant but Internet and radio was. The more attention paid to climate change news stories on the Internet meant that people were more likely to Emotionally Respond, less likely to Agree That Talking About Climate Change is Boring, and more likely to Disagree That Talking About Climate Change is Boring. The Internet can communicate large amounts of climate change news stories making individuals emotional to it and thinking it is not a boring topic to talk about. Lastly, the more attention paid to news stories on the radio meant that people were less likely to Disagree with Often Talking About Climate Change. By paying attention to news stories on the radio, it leaves individuals wanting to continue the conversation with others.

The Role of Attention Given to Climate Change Entertainment Stories

Attention to climate change entertainment stories also had limited impact on whether or not individuals were skeptical of climate change. Attention given to climate change entertainment stories on the Internet, television, and radio was not significant but social media and newspaper was. The more attention given to entertainment stories in the newspaper meant that people were more likely to Reject Evidence. With climate change being communicated as a form of entertainment, the evidence doesn't appear as accurate and is more likely to be rejected. Lastly, the more attention given to entertainment stories in social media meant that people were less likely to Disagree with Often Talking About Climate Change. With social media being a platform for users to share content, it can be understood why individuals were less likely to disagree with

talking about it. Since the point of these climate change stories is to entertain, people could be expecting their portrayal of climate change to not be an accurate representation of reality.

The Role of Perceived Media Credibility

Perceived media credibility had limited impact on whether or not individuals were skeptical of climate change. While television and radio credibility were not significant, Internet, social media, and newspaper was. The more credible an Internet source is perceived to be, the less likely people were to Emotionally Respond. Internet credibility appears to make individuals more skeptical of climate change by lacking an emotional response to it. This could be depending on the website being viewed, if it is communicating climate change skepticism and is perceived as a credible source than individuals would not have an emotional response to climate change. On the other hand, the more credible newspaper is perceived as, individuals are less skeptical of climate change. Here, people were more likely to Accept Evidence, Emotionally Respond and believe it is Within Understanding. The more credible newspaper is perceived as also meant that people were more likely to Agree That Talking About Climate Change is Boring, this was also found with social media credibility. An explanation for this could be an overload of information making them feel so well informed that there is no reason to talk about it or it would become boring. When looking at social media credibility, the more credible the source is perceived as, the more likely people were to Disagree with Often Talking About Climate Change. Again, with social media being a platform for

users to communicate with others about, it is understood why they were more likely to often talk about climate change.

The Role of Broadcast Network Consumption

Broadcast network consumption showed to impact whether or not individuals were skeptical of climate change. The more consumption of “other” broadcast networks meant that people were more likely to Reject Evidence and were less likely to Accept Evidence. The more consumption of Fox Network and Fox News also meant that people were less likely to Accept Evidence. Also, with the more Fox News consumption, people were less likely to Disagree That Talking About Climate Change is Boring. Since Fox Corporation is a conservative cable news channel, it is clear why its viewers would be more skeptical of climate change and want to talk about their skepticism. As it was discussed in the literature review, Fox News intentionally advocated skepticism towards climate change by communicating scientific uncertainty about the issue (Hart, 2008). With the more consumption of MSNBC, people were more likely to Accept Evidence. Since MSNBC’s audience is generally more liberal, it is understood why its viewers would accept climate change evidence. Lastly, with the more consumption of ABC, people were less likely to Emotionally Respond. While ABC is generally neither conservative or liberal, this finding makes it seem like their climate change is more conservative.

The Role of Gender

Similar to previous findings, males were more skeptical of climate change than females. Specifically, males were less likely than females to Accept Evidence and Emotionally Respond. Males were also less likely than females to Disagree That Talking About Climate Change is Boring and to Disagree with Often Talking About Climate Change. With this, it can be argued that women value the environment more and are more concerned of it than men are. Also, it could be argued that men are more conservative than women.

The Role of Race

Since this study's participants were mostly White students, limited significance was found for race and climate change skepticism or belief. However, identifying as White showed to be insignificant. Identifying as Hispanic or Latino meant that they were less likely to Reject Evidence, less likely to Agree That Talking About Climate Change is Boring, and less likely to Disagree with Often Talking About Climate Change. With these findings it is clear that Hispanic or Latino cultures, in this study, are less skeptical of climate change and believe it is a problem that is worth talking about. It could be argued that there is an unexplained variable that is making this group more aware of the issues caused by climate change.

Pro-Environmental Behaviors

The Role of Political Orientation

Political Orientation had limited impact on whether or not individuals were willing to behave in ways that are pro-environment. Identifying as conservative on economic issues meant that people were less likely to take on Low-Waste Shopping Behaviors and less likely to take on Low-Impact Transportation Behaviors. Identifying as conservative on economic issues also meant that people were less likely to Reuse or Repair Items. Consistent with the findings regarding conservatism and climate change skepticism, when people are skeptical of climate change they would not be willing to act in ways that would help the problem. However, identifying as liberal on social issues meant that people were less likely to Compost Kitchen Waste and were less likely to Write Letters to Politicians; whereas, identifying as liberal on economic issues meant that people were more likely to Write Letters to Politicians and were more likely to Protest Environmental Issues. Identifying as a liberal on economic issues meant that people were willing to behave in ways that are pro-environment, while identifying as liberal on social issues did not. Pro-environmental behaviors are behaviors that require socialized economic efforts, like government lead recycling.

The Role of Self-Reported Climate Change Knowledge

Self-reported climate change knowledge greatly impacted whether or not individuals were willing to behave in ways that are pro-environment. The more self-reported climate change knowledge meant that people were more likely people were to behave in ways that are Energy-Saving, Low-Waste Shopping Behaviors, and Low-Impact Transportation Behaviors. Additionally, the more self-reported knowledge meant

that people were more likely were to Drive Economically, Compost Kitchen Waste, and Protest Environmental Issues. These findings show how when individuals report that they are more knowledgeable about climate change, they are willing to behave in ways that help reduce the problem. This is consistent with research discussed in the literature review, Sinatra et al. (2010) found that individuals expressed greater willingness to behave in ways that are pro-environment when exposed to climate change information.

The Role of News Media Consumption

News media consumption had limited impact on whether or not individuals were willing to behave in ways that are pro-environment, only news consumption via social media was significant. With the more social media consumption for news purposes meant that people were less likely to Compost Kitchen Waste, Turn Off Water While Brushing Teeth, and Protest Environmental Issues. An explanation for this could be the idea that what is being communicated via social media, isn't teaching people how important these behaviors are or how to perform these behaviors.

The Role of Exposure to Climate Change News Stories

Exposure to climate change news stories had limited impact on whether or not individuals were willing to behave in ways that are pro-environment. When looking at Internet, the more exposure to news stories meant that people were more likely to Drive Economically. However, the more exposure to news stories in the newspaper, meant that people were less likely to Drive Economically. A possible explanation for this is that the

Internet is providing a more hopeful outlook making individuals believe that driving economically would be beneficial unlike with newspaper which is making them believe that it is a lost cause. When looking at radio, the more exposure to news stories meant that people were more likely to Compost Kitchen Waste, Write Letters to Politicians, and Protest Environmental Issues. With these findings, it can be argued that the radio is providing more information and encouraging its listeners to act on it. Lastly, the more exposure to news stories on social media meant that people were more likely to Turn Off Water While Brushing Teeth. While the opposite was found with news media consumption, in this case, the behavior information could be communicated in climate change specific content.

The Role of Attention Given to Climate Change News Stories

Attention given to climate change news stories had limited impact on whether or not individuals were willing to behave in ways that are pro-environment. While social media, Internet, and television were not significant, radio and newspaper were. With the more attention given to news stories on the radio meant that people were more likely to Reuse or Repair Items. Additionally, the more attention paid to news stories in the newspaper meant that people were more likely to Write Letters to Politicians, and Protest Environmental Issues. Paying attention to climate change news stories on these traditional forms of media allows individuals to have more information on the issue, making them more willing to behave in ways that help the issue.

The Role of Climate Change Skepticism/Belief

Climate change skepticism or belief had limited impact on whether or not individuals were willing to behave in ways that are pro-environment. With the more belief by Emotionally Responding, people were more likely to adopt Low-Waste Shopping Behaviors. However, with the more belief that climate change is Within Understanding, meant that people were less likely to adopt Low-Waste Shopping Behaviors. An explanation for these inconsistent findings could be that a greater degree of belief is felt with an emotional response to the problem compared to thinking the problem is within one's understanding. When looking at climate change belief of Accepting Evidence, people were more likely to adopt Habitual Behaviors. With the acceptance of climate change evidence, people are more willing to have habitual behaviors that are pro-environment. However, with the more acceptance of climate change evidence, people were less likely to Protest Environmental Issues. This could be because protesting does not help change the evidence. In contrast, with the more Emotionally Responding to climate change, people were more likely to Write Letters to Politicians and more likely to Drive Economically. With the more Agreeing That Talking About Climate Change is Boring, people were less likely to behave in ways that are energy-saving and with the more Disagreeing That Talking About Climate Change is Boring, people were more likely to behave in ways that are Energy-Saving. When an individual believes an issue to be boring, they would be less willing to behave in ways that help the issue than those who believes it is not boring. Additionally, with the more Agreeing with Often Talking About Climate Change, people were more likely to behave

in Low-Impact Transportation Behaviors and Low-Waste Shopping Behaviors. However, with the more Disagreeing with Often Talking About Climate Change, people were more likely to adopt Habitual Behaviors. An explanation for this could be the idea that just because an individual doesn't talk about an issue, doesn't mean they are willing to change their habitual behaviors. With the more Agreeing with Often Talking About Climate Change, people were more likely to Protest Environmental Issues and were more likely Write Letters to Politicians. When individuals often talk about an issue, they are more willing to voice their opinion. However, with the more Disagreeing with Often Talking About Climate Change, people were still more likely to Turn Off Water While Brushing Teeth. Again, this could be because of the idea that just because an individual doesn't talk about an issue, doesn't mean they are willing to change their behaviors.

The Role of Gender

Gender had limited impact on whether or not individuals were willing to behave in ways that are pro-environment. Males were less likely than females to behave in Low-Waste Shopping Behaviors. Consistent with the findings that males are more skeptical of climate change than females, it makes sense why they would also be less likely to behave in ways that are pro-environment. Additionally, identifying as "other" gender meant that people were more likely to take on Low-Impact Transportation Behaviors and Write Letters to Politicians. With these findings regarding "other" gender, it can be said that these individuals are more willing to try and make changes for social issues since they often experience them.

The Role of Race

As previously stated, since this study's participants were mostly White students, limited significance was found for race and pro-environmental behaviors. Identifying as "other" race meant that people were less likely to adopt Habitual Behaviors; whereas, identifying as "other" race meant that they were more likely to Write Letters to Politicians and Protest Environmental Issues. Identifying as Native American meant that individuals were less likely to Protest Environmental Issues and identifying as Hispanic or Latino meant that individuals were more likely to Compost Kitchen Waste. It could be said that composting is a common cultural behavior for Hispanic or Latinos. As for Native Americans, due to their history and past experiences, they could believe that protesting is not effective and doesn't lead to any changes.

Limitations and Future Studies

This study had several limitations, including the sampling method used and the small sample size. Respondents were recruited from their communication courses and were not a representation of the university. With that being said, surveying undergraduate students is still important because they are the generation that will grow up having to deal with the negative effects of climate change. It is important to know how skeptical or not they are of the issue. Another limitation of this study is the time that it was conducted, during this time the global pandemic due to COVID-19 was occurring. Pandemic related topics dominated the mass media and continue to do so which may

have influenced how respondent's answered questions relating to climate change in the media. It could be argued that respondents were too distracted with the pandemic, however, it could also be argued that respondents were more focused on all global issues going on like climate change. Another limitation of this study was the scale it used to measure political orientation. In some cases, identifying as conservative meant the individual was more skeptical of climate change, but this finding wasn't consistent. The measure of media variables is another limitation of this study, social media and Internet were broadly asked which could have been challenging for participants to differentiate between.

After looking at the limitations of this study, the ideas for future studies can be addressed. Since this study did not use a representative sample, conducting a national survey using random sampling would allow for generalizability. In addition to having a stronger sample, having a stronger measurement of political orientation could be used in a future study. Since this study used two categories of political orientation, economic and social, adding more detailed categories would provide a better measure. Another idea could be asking questions relating to respondent's political engagement. Additionally, having a stronger measurement for media use could be used in a future study, such as by asking for specific media platforms or Internet websites. A final idea for a future study could be to examine individual's pre-existing beliefs in relation to climate change skepticism and pro-environmental behaviors.

References

- Arlt, D., Hoppe, I., & Wolling, J. (2011). Climate change and media usage, effects on problem awareness and behavioral intentions, *The International Communication Gazette*, 73(1-2), 45-63. DOI: 10.1177/1748048510386741
- Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior*. Berlin, Heidelberg: Springer Press.
- Brulle, J., Carmichael, J., Jenkins, C. (2012). Shifting public opinion on climate change: An empirical assessment of factors influencing concern over climate change in the U.S., 2002-2010, *Springer Science and Business Media*. DOI 10.1007/s1058-012-0403-y
- Carmichael, J. & Brulle, R. (2016). Elite cues, media coverage, and public concern: An integrated path analysis of public opinion on climate change, 2001-2013. *Environmental Politics*, 1-23. DOI: 10.1080/09644016.2016.1263433
- Feldman, L., Maibach, E., Roser-Renouf, C. (2011). Climate on cable: The nature and impact of global warming coverage on Fox News, CNN, and MSNBC. *The International Journal of Press and Politics*. DOI: 10.1177/1940161211425410
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, California: Stanford University Press.
- Frantz, C. & Mayer, F. S. (2009). The emergency of climate change: Why are we failing to take action? *Analyses of Social Issues and Public Policy*. 9(1), 205-222. DOI: 10.1111/j.1530-2415.2009.01180.x
- Geiger, N. & Swim, J. (2016). Climate of silence: Pluralistic ignorance as a barrier to

- climate change discussion, *Journal of Environmental Psychology*, 1-13.
- Gifford, R. & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behavior: A review, *International Journal of Psychology*, 5(1), 5-23.
- Guy, S., Kashima, Y., Walker, I., & O'Neill, S. (2014). Special issue article: The social psychology of climate change investigating the effects of knowledge and ideology on climate change, *European Journal of Social Psychology*, 44, 421-429. DOI: 10.1002/ejsp.2039
- Hamilton, Lawrence, C., Hartter, J., Lemcke-Stampone, M., Moore, D., Safford, T. (2015). Tracking public beliefs about anthropogenic climate change. *PLoS One* 10(9): E0138208.
- Hart, P. (2008). Market influences on climate change frames in CNN and Fox News climate change broadcasts. *Presented at the International Communication Association. Annual Meeting, Montreal, Quebec, Canada.*
- Hmielowski, J., Feldman, L., Myers, T., Leiserowitz, A., & Maibach, E. (2014). An attack on science? Media use, trust in scientists, and perceptions of global warming, *Public Understanding of Science*, 23(7), 866-883. DOI: 10.1177/0963662513480091
- Huang, H. (2015). Media use, environmental beliefs, self-efficacy, and pro-environmental behaviors, *Journal of Business Research*, 1-29. DOI: 10.1177/1940161211425410
- Lee, J. & Cho, M. (2020). The effects of consumers' media exposure, attention, and

credibility on pro-environmental behaviors, *Journal of Promotion Management*, 26(3), 434-455, DOI: 10.1080/10496491.169962

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Ballew, M., Goldberg, M., & Gustafson, A. (2019). *Climate change in the American mind: November 2019*. Retrieved from https://climatecommunication.yale.edu/wp-content/uploads/2019/12/Climate_Change_American_Mind_November_2019b.pdf

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Gustafson, A., Ballew, M., & Goldberg, M. (2019). Climate activism: Beliefs, attitudes, and behaviors: November 2019. Retrieved from <https://climatecommunication.yale.edu/wp-content/uploads/2020/02/global-warming-activism-november-2019.pdf>

Liu, X., Vedlitz, A., & Shi, L. (2014). Examining the determinants of public environmental concern: Evidence from national public surveys, *Environmental Science & Policy*, 39, 77-94. DOI: 10.1016/j.envsci.2014.02.006

Roser-Renouf, C., Maibach, E., Leiserowitz, A., Rosenthal, S. (2016). *Global warming's six Americans and the election, 2016*. New Haven, CT: Yale Program on Climate Change Communication

Martins, N., Weaver, A., Lynch, T. (2018). What the public “knows” about media effects research: The influence of news frames on perceived credibility and belief change, *Journal of Communication*, 68, 98-119.

McCright, A. & Dunlap, R. (2011). The politicization of climate change and polarization

- in the American public's views of global warming, 2001-2010, *The Sociological Quarterly*, 52, 155-194.
- Milfont, T., Milojev, P., Greaves, L., & Sibley, C. (2015). Socio-structural and psychology foundations for climate change beliefs, *New Zealand Journal of Psychology*, 44(1), 18-30.
- Noelle-Neumann, E. (1937). Turbulences in the climate of opinion: Methodological applications of the spiral of silence theory, *Public Opinion Quarterly*, 1(1), 143-1580.
- Piccolo, L. & Alani, H. (2015). Perceptions and behaviors towards climate change and energy savings: The role of social media, *The Open University's Repository of Research Publications*, 7-9, 108-116.
- Santos, J. & Feygina, I. (2017) Responding to climate change skepticism and the ideological divide, *Michigan Journal of Sustainability*, 5(1), 5-23.
- Shi, J., Visschers, V. H. M., Siegrist, M. (2015). Public perception of climate change: The importance of knowledge and cultural worldviews, *Risk Analysis*, 35(12), DOI: 10.1111/risa.12406
- Sinatra, G., Kardash, C. M., Taasoobshirazi, G., & Lombardi, D. (2011). Promoting attitude change and expressed willingness to take action toward climate change in college students, *Springer Science & Business Media*. DOI: 10.1007/s11251-011-9166-5
- Smith, R. D. (2005). *Strategic planning for public relations*. Mahwah, NJ.: Lawrence Erlbaum Associates, Inc.

- Stevenson, K., Peterson, M., Bondell, H., Moore, S., Carrier, S. (2014). Overcoming skepticism with education: Interacting influences of worldview and climate change knowledge on perceived climate change risk among adolescences, *Springer Science and Business Media*. DOI: 10.1007.s10584-1228-7
- Taddicken, M. (2013). Climate change from the user's perspective: The impact of mass media and internet use and individual and moderating variables on knowledge and attitudes, *Journal of Media Psychology*, 25(1), 39-52. DOI: 10.1027/1864-1105
- Takahashi, B. & Tandoc, E. (2016). Media sources, credibility, and perceptions of science: Learning about how people learn about science, *Public Understanding of Science*, 25(6), 674-690. DOI: 10.1177/0963662515574986
- U.S. Global Change Research Program. (2019). *Understand climate change*. Retrieved from: <https://www.globalchange.gov/climate-change>
- Whitmarsh, L. (2011). Skepticism and uncertainty about climate change: Dimensions, determinants, and change over time, *Global Environmental Change*, 21(2), 690-700.
- Whitmarsh, L. & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviors, *Journal of Environmental Psychology*, 30(3), 305-314. DOI: 10.1016/j.jenvp.2010.01.003
- Yadav, Y. & Rani, R. (2011). Role of communication in climate change and sustainable development, *Global Media Journal*, 2(2).

Table 1. Demographic break-down of year in school and gender

Trait	<i>N</i>	%
Year in school		
First-year	176	29.2
Second-year	203	33.7
Third-year	99	16.4
Fourth-year	124	20.6
Gender		
Male	314	52.2
Female	279	46.3
Other	9	1.5

Table 2. Demographic break-down of racial groups

Trait	<i>N</i>	%
Racial Group		
Caucasian	509	84.6
Black or African-American	19	3.2
Hispanic or Latino	20	3.3
Asian or Pacific Islander	12	2.0
Native American	1	.2
More than one race	39	6.5
Other	2	.3

Table 3. Demographic break-down of yearly family household income

Trait	<i>N</i>	%
Yearly Family Household Income		
\$0.00-\$19,999.00	24	4.0
\$20,000-\$39,999.00	45	7.5
\$40,000-\$59,999.00	73	12.1
\$60,000-\$79,999.00	101	16.8
\$80,000-\$99,999.00	101	16.8
\$100,000-\$119,999.00	95	15.8
\$120,000-\$139,999.00	50	8.3
\$140,000 or above	113	18.8

Table 4. Factor analysis of source credibility in different forms of media ($N = 602$)

Items	<i>F1</i>	Alpha (reliability scores)
<i>Social media</i>		.92
Overall credibility	.92	
Honesty	.87	
Competence	.85	
Expertise	.85	
Goodwill	.84	
<i>Internet</i>		.92
Overall credibility	.89	
Honesty	.87	
Competence	.87	
Expertise	.86	
Goodwill	.83	
<i>Television</i>		.93
Overall credibility	.92	
Honesty	.89	
Competence	.89	
Expertise	.88	
Goodwill	.85	
<i>Radio</i>		.95
Competence	.92	
Overall credibility	.92	
Honesty	.92	
Expertise	.89	
Goodwill	.89	
<i>Newspaper</i>		.96
Overall credibility	.94	
Competence	.93	
Honesty	.92	
Goodwill	.91	
Expertise	.91	

Note: Loadings over 0.50 appear in bold

Table 5. Factor analysis of climate change skepticism ($N = 602$)

Items	Factors		
	<i>F1</i>	<i>F2</i>	<i>F3</i>
The evidence for climate change is unreliable	.82	.11	.01
Floods and heat-waves are not increasing, there is just more media reporting	.78	.17	-.02
There is too much conflicting evidence to know if human activity is a cause	.74	.14	.07
Too much fuss is made about climate change	.71	.29	-.00
Climate change is too complex for scientists to make useful forecasts	.69	.05	.02
It is too early to say whether climate change is really a problem	.70	.05	.23
I am uncertain about whether it is really happening	.54	-.04	.33
Claims that human activities are changing the climate are exaggerated	.34	.01	-.03
Climate change is just a natural fluctuation in earth's temperatures	.58	.25	.13
I do not believe climate change is a real problem	.60	.01	-.02
Many leading experts still question if human activity contributes	.56	-.02	.01
The media is often too alarmist about issues like climate change	.61	.33	-.00
Climate change frightens me	.08	.81	.13
Climate change fills me with dread	-.12	.67	.17
I feel a moral duty to help	.05	.71	.10
I consider climate change to be an unacceptable risk	.18	.73	-.20
The effects of climate change will be catastrophic	.25	.70	-.23
Floods and heat-waves are due to climate change	.32	.66	-.24
Climate change is too complicated for me to understand	.13	-.04	.77
I need more information to form a clear opinion about climate change	.04	.01	.78
Alpha (reliability scores)	.86	.81	.58

Note: Loadings over 0.50 appear in bold

Table 6. Factor analysis of climate change belief ($N = 602$)

Items	Factors		
	<i>F1</i>	<i>F2</i>	<i>F3</i>
The evidence for climate change is unreliable	.84	.27	.19
It is too early to say whether climate change is really a problem	.81	.26	.19
Too much fuss is made about climate change	.82	.34	.11
Floods and heat-waves are not increasing, there is just more media reporting	.75	.32	.24
There is too much conflicting evidence to know if human activity is a cause	.81	.29	.26
I do not believe climate change is a real problem	.80	.23	.04
Climate change is too complex for scientists to make useful forecasts	.79	.21	.22
I am uncertain about whether it is really happening	.73	.19	.32
The media is often too alarmist about issues like climate change	.73	.34	.23
Climate change is just a natural fluctuation in earth's temperatures	.67	.34	.07
Claims that human activities are changing the climate are exaggerated	.65	.20	.09
Many leading experts still question if human activity contributes	.67	.23	.31
Climate change fills me with dread	.04	.79	.04
Climate change frightens me	.29	.81	.03
I feel a moral duty to help	.37	.71	.18
Floods and heat-waves are due to climate change	.40	.68	.16
The effects of climate change will be catastrophic	.47	.70	.13
I consider climate change to be an unacceptable risk	.38	.73	.18
Climate change is too complicated for me to understand	.23	.06	.82
I need more information to form a clear opinion about climate change	.25	.19	.79
Alpha (reliability scores)	.96	.90	.66

Note: Loadings over 0.50 appear in bold

Table 7. Factor analysis of pro-environmental behaviours ($N = 602$)

Items	Factors			
	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>
Buy energy-efficient home	.87	.12	.10	.02
Install renewable energy system	.86	.22	.05	.05
Install efficient heating	.84	.04	.06	.10
Use green energy tariff	.77	.34	.12	.01
Install insulation in home	.67	-.10	.09	.14
Buy low-emission vehicle	.65	.31	.08	-.02
Buy products to save water	.49	.07	.02	.36
Avoid eating meat	.06	.75	-.02	-.23
Buy products with less packaging	.22	.67	.23	.13
Buy eco-friendly products	.24	.61	.26	.27
Buy locally-grown food	.08	.58	.18	.22
Take short showers	.10	.49	.19	.24
Car pool	.00	.12	.67	.08
Cut down on flying	.05	.02	.67	.07
Shop online	.10	.20	.64	.05
Walk, cycle, public transportation	.15	.22	.62	.03
Turn off lights	.11	.07	.08	.79
Recycle	.06	.20	.11	.73
Alpha (reliability scores)	.87	.71	.60	.55

Note: Loadings over 0.50 appear in bold

Table 8. Means and standard deviations for political orientation on a scale of “1” (doesn’t identify) to “5” (does identify)

Trait	ME	SD
Political orientation on economic issues		
Conservative	1.32	1.76
Liberal	.84	1.51
Political orientation on social issues		
Conservative	1.03	1.62
Liberal	1.25	1.78

N=602

Table 9. Means and standard deviations for number of minutes spent on forms of media

<u>Form of Media and Use</u>	<u>ME</u>	<u>SD</u>
Social media for entertainment	143.89	102.48
Internet for entertainment	166.94	165.70
Television for entertainment	91.85	96.20
Radio for entertainment	21.33	61.88
Newspaper for entertainment	6.62	15.82
Social media for news	41.31	60.02
Internet for news	49.37	91.53
Television for news	23.10	42.62
Radio for news	4.66	20.91
Newspaper for news	8.33	16.76

N=602

Table 10. Mean and standard deviations for credibility of source in media forms on a scale of “1” (does not possess) to “7” (does possess)

<u>Media and Credibility Characteristic</u>	<u>ME</u>	<u>SD</u>
Social media		
Expertise	4.31	1.43
Competence	4.52	1.36
Honesty	4.23	1.53
Goodwill	4.33	1.46
Overall credibility	4.40	1.47
Internet		
Expertise	4.68	1.25
Competence	4.66	1.24
Honesty	4.22	1.34
Goodwill	4.31	1.27
Overall credibility	4.57	1.30
Television		
Expertise	4.83	1.43
Competence	4.69	1.38
Honesty	4.18	1.54
Goodwill	4.30	1.45
Overall credibility	4.61	1.46
Radio		
Expertise	4.26	1.49
Competence	4.37	1.43

Honesty	4.37	1.45
Goodwill	4.44	1.43
Overall credibility	4.37	1.44
<u>Newspaper</u>		
Expertise	4.95	1.47
Competence	4.88	1.49
Honesty	4.73	1.50
Goodwill	4.73	1.50
Overall credibility	4.96	1.52

N=602

Table 11. Mean and standard deviations for exposure to climate change stories on a scale of “1” (very little) to “5” (a great deal)

<u>Media Form and Use</u>	<u>ME</u>	<u>SD</u>
<u>Entertainment Stories</u>		
On social media	2.38	1.39
On the internet	2.28	1.32
On television	1.87	1.30
On the radio	1.12	1.17
In newspapers	1.15	1.26
<u>News Stories</u>		
On social media	2.80	1.42
On the internet	2.82	1.27
On television	2.12	1.33
On the radio	1.18	1.22
In newspapers	1.44	1.48

N=602

Table 12. Mean and standard deviations for attention given to climate change stories on a scale of “1” (very little) to “5” (a great deal)

<u>Media Form and Use</u>	<u>ME</u>	<u>SD</u>
<u>Entertainment Stories</u>		
On social media	2.47	1.34
On the internet	2.45	1.28
On television	2.08	1.33
On the radio	1.18	1.27

In newspapers	1.19	1.37
News Stories		
On social media	2.61	1.31
On the internet	2.70	1.25
On television	2.27	1.36
On the radio	1.35	1.38
In newspapers	1.51	1.62

N=602

Table 13. Mean and standard deviations for self-reported climate change knowledge on a scale of “1” (not very knowledgeable) to “10” (very knowledgeable)

Climate Change Knowledge	ME	SD
Knowledgeable	4.89	2.14

N=602

Table 14. Mean and standard deviations for number of hours spent watching broadcast networks on a scale of “0” (no hours) – “12” (5.5 or more hours)

Network	ME	SD
ABC	.42	.76
NBC	.38	.71
CBS	.28	.65
Fox Network	.33	.68
MSNBC	.23	.62
Fox News	.51	.77
CNN	.44	.79
Other	.44	.74

N=602

Table 15. Means and standard deviations for climate change skepticism on a scale of “1” (disagree) to “5” (agree)

Item	ME	SD
------	----	----

“Claims that human activities are changing the climate are exaggerated”	1.02	1.65
“Climate change is just a natural fluctuation in earth’s temperatures”	1.57	1.85
“I do not believe climate change is a real problem”	.32	1.00
“I am uncertain about whether climate change is really happening”	.36	.95
“It is too early to say whether climate change is really a problem”	.27	.88
“The evidence for climate change is unreliable”	.29	.90
“There is too much conflicting evidence to know if human activity is a cause”	.42	1.02
“Climate change is too complex for scientists to make useful forecasts”	.34	.96
“Too much fuss is made about climate change”	.43	1.12
“Floods and heat-waves are not increasing, there is just more media reporting”	.35	.95
“Many leading experts still question if human activity contributes”	.53	1.16
“The media is often too alarmist about issues like climate change”	.76	1.43
“Talking about climate change is boring”	.79	1.47
“Climate change fills me with dread”	1.07	1.65
“Climate change frightens me”	.96	1.63
“I feel a moral duty to help”	.58	1.34
“Floods and heat-waves are due to climate change”	.43	1.13
“The effects of climate change will be catastrophic”	.42	1.10
“I consider climate change to be an unacceptable risk”	.42	1.03
“Climate change is too complicated for me to understand”	.66	1.28
“I often talk about climate change to family or friends”	1.73	2.00
“It is difficult to know which products are better for the environment”	.98	1.43
“I need more information to form a clear opinion about climate change”	1.29	2.72

N=602

Table 16. Means and standard deviations for climate change belief on a scale of “1” (disagree) to “5” (agree)

Item	ME	SD
“Claims that human activities are changing the climate are exaggerated”	1.65	1.90
“Climate change is just a natural fluctuation in earth’s temperatures”	1.57	1.85
“I do not believe climate change is a real problem”	2.85	2.00
“I am uncertain about whether climate change is really happening”	2.49	2.10
“It is too early to say whether climate change is really a problem”	2.60	2.02
“The evidence for climate change is unreliable”	2.43	2.04
“There is too much conflicting evidence to know if human activity is a cause”	2.21	2.04
“Climate change is too complex for scientists to make useful forecasts”	2.13	1.99
“Too much fuss is made about climate change”	2.47	2.08
“Floods and heat-waves are not increasing, there is just more media reporting”	2.05	2.02
“Many leading experts still question if human activity contributes”	1.65	1.98
“The media is often too alarmist about issues like climate change”	1.73	2.00
“Talking about climate change is boring”	1.69	1.98
“Climate change fills me with dread”	.99	1.55
“Climate change frightens me”	1.37	1.70
“I feel a moral duty to help”	1.51	1.71
“Floods and heat-waves are due to climate change”	1.27	1.69
“The effects of climate change will be catastrophic”	1.74	1.90
“I consider climate change to be an unacceptable risk”	1.44	1.83
“Climate change is too complicated for me to understand”	1.45	1.72
“I often talk about climate change to family or friends”	.71	2.00
“It is difficult to know which products are better for the environment”	1.06	1.58

“I need more information to form a clear opinion about climate change” 1.08 1.74

N=602

Table 17. Means and standard deviations for pro-environmental behaviours on a scale of “0” (not willing) to “7” (already took action)

Behaviour	ME	SD
Install insulation in home	4.52	1.80
Buy energy-efficient home	4.25	1.67
Install efficient heating	4.56	1.58
Install renewable energy system	4.25	1.61
Use green energy tariff	3.69	1.80
Buy low-emission vehicle	3.74	1.94
Buy products to save water	5.53	1.76

N=602

Table 18. Means and standard deviations for pro-environmental behaviours on a scale of “0” (never) to “3” (always)

Behaviour	ME	SD
Turn off lights	2.43	.68
Drive economically	1.61	.86
Walk, cycle, public transportation	1.34	.92
Shop online	1.48	.79
Car pool	1.52	.82
Cut down on flying	1.81	1.00
Buy eco-friendly products	1.53	.78
Eat locally-grown food	1.41	.73
Avoid eating meat	.54	.86
Buy products with less packaging	1.24	.83
Recycle	2.35	.73
Reuse or repair items	1.82	.82
Compost kitchen waste	.72	.94
Take short showers	1.22	.86
Turn off water while brushing teeth	2.15	1.01
Write to politicians about issues	.28	.66
Protest environmental issues	.34	.72

N=602

Table 19. Multiple regression analysis of the predictors of climate change skepticism

Predictors	Rejecting Evidence			Lacking Emotions			Beyond Understanding		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	$\frac{SE}{B}$	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors									
Males							-	4.775	-
Other Gender							13.628		.134**
Hispanic / Latino	-	35.583	-.090*				-	19.073	-.091*
Conservative – Economic	.993	.292	.201**	.579	.215	.174**	38.194		
Conservative – Social	1.147	.312	.217** *						
Liberal – Economic							-.312	.123	-
Media predictors									.185**
See stories on TV - Entertainment	.791	.407	.120*						
See stories on radio - Entertainment	1.087	.523	.149*						
Attention to stories in newspaper - Entertainment	.982	.490	.157*						
Other network minutes	1.582	.600	.114**						
Internet minutes - Entertainment				.838	.309	.125**			
Internet credibility				-.872	.355	-.120*			
<i>R</i> ₂	.315			.177			Model not significant		
Adjusted <i>R</i> ₂	.246			.094					
<i>F</i> for change in <i>R</i> ₂	.941			2.054					

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 20. Multiple regression analysis of the predictors of climate change belief

Predictors	Accepting Evidence			Emotionally Responding			Within Understanding		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	$\frac{SE}{B}$	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors									
Males	-59.25	28.99	-.075*	-26.09	13.32	-.077*			
Other Gender									
Conservative – Economic									
Conservative – Social				.579	.294	.111*	.378	.115	.205*
Liberal – Economic							.318	.134	.161*
Liberal – Social	3.299	.652	.296** *	.974	.300	.204* *	.236	.118	.140*
Media predictors									
See stories on TV - News	-2.043	.757	-.137**	-.823	.348	-.129*			
See stories on radio - News	2.351	.949	.145*						
Newspaper minutes - News	2.685	1.308	.095*						
Attention to internet story - News				1.070	.480	.158*			
Fox Network minutes	-4.345	1.682	-.124**						
MSNBC minutes	3.850	1.746	.101*						
ABC minutes				-1.364	.659	-.103*			
Fox News minutes	-2.973	1.448	-.096*						
Other network minutes	-2.446	1.230	-.076*						
Newspaper credibility	2.561	.879	.127**	.832	.404	.096*	.403	.159	.133* *
<i>R</i> ₂	.463			.380			.229		
Adjusted <i>R</i> ₂	.409			.318			.151		
<i>F</i> for change in <i>R</i> ₂	1.906			1.006			2.014		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 21. Multiple regression analysis of the predictors of agree or disagree that talking about climate change is boring

Predictors	Agree: It is boring			Disagree: It is boring		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors						
Males				-10.218	3.150	-.129**
Hispanic / Latino	-17.227	6.149	-.105**			
Conservative – Social	.170	.056	.188**			
Liberal – Economic				.180	.081	.137*
Liberal – Social				.163	.071	.146*
Media predictors						
Attention to internet story - News	-.216	.092	-.184*	.282	.114	.178*
See stories on TV - News				-.184	.082	-.123*
Radio minutes - News				.526	.234	.099*
Fox news minutes				-.371	.157	-.119*
Social media credibility	.182	.071	.111**			
Newspaper credibility	.150	.077	.100*	.832	.404	.096*
<i>R</i> ₂	.240			.366		
Adjusted <i>R</i> ₂	.163			.302		
<i>F</i> for change in <i>R</i> ₂	2.196			1.074		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 22. Multiple regression analysis of the predictors of agree or disagree with often talking about climate change

Predictors	Agree: Often Talk			Disagree: Often Talk		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors						
Males				-6.940	3.340	-.087*
Hispanic / Latino				-18.352	8.404	-.082*
Liberal – Social	.133	.051	.181**			
Conservative – Social				.192	.074	.156**
Media predictors						
Attention to social media story - Entertainment				-.250	.119	-.167
Attention to radio story - News				-.212	.105	-.146*
Attention to social media story - Entertainment				-.250	.119	-.167*
Attention to internet story - News	-.216	.081	.208**			
See stories on social media - News	.133	.058	.145*			
See stories in newspaper - Entertainment	-.169	.076	-.164*			
See stories on TV - News				.175	.087	.116*
See stories on radio - News				-.236	.109	-.144*
TV minutes - Entertainment				-.274	.136	-.082*
Social media credibility	.182	.071	.111**	.303	.092	1.36
<i>R</i> ₂	.245			.302		
Adjusted <i>R</i> ₂	.168			.232		
<i>F</i> for change in <i>R</i> ₂	1.052			4.023		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 23. Multiple regression analysis of the predictors of agree or disagree that it is hard to tell which products are better for the environment

Predictors	Agree: It is Hard to Tell			Disagree: It is Hard to Tell		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors						
More than one race				17.798	5.581	.138
Liberal – Social	.188	.061	.232**			
Liberal – Economic				.178	.077	.169*
Media predictors						
Attention to radio story - News	.187	.085	.180	-.212	.105	-.146*
Attention to radio story - Entertainment	-.191	.095	-.168*	-.250	.119	-.167*
Internet minutes – News	.359	.177	.115	-.274	.136	-.082*
Fox Network minutes	-.382	.156	-.150*	.303	.092	1.36
<i>R</i> ₂	Model not significant			Model not significant		
Adjusted <i>R</i> ₂						
<i>F</i> for change in <i>R</i> ₂						

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 24. Multiple regression analysis of energy-saving behaviors and low-waste shopping behaviors

Predictors	Energy-Saving Behaviors			Low-Waste Shopping Behaviors		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors						
Males				-5.236	1.451	-.142***
Conservative - Economic				-.065	.030	-.122*
Skeptic or belief predictors						
Talking about it is boring - Agree	-.060	.030	-.093*			
Talking about it is boring - Disagree	.054	.028	.115*			
Often talk about it – Agree				.086	.034	.121*
Belief Variable 2: Emotional response				.140	.046	.214**
Belief Variable 3: Ability to understand				-.068	.034	-.110*
Self-reported Knowledge predictor						
	.173	.042	.197***	.167	.041	.193***
<i>R</i> ₂	.308			.332		
Adjusted <i>R</i> ₂	.259			.284		

N=602

* $p < .05$, ** $p < .01$, $p^{***} < .001$

Table 25. Multiple regression analysis of low-impact transportation behaviors and habitual behaviors

Predictors	Low-impact Transportation Behaviors			Habitual Behaviors		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Demographic predictors						
Other gender	15.058	6.740	.092*			
Other race				-37.390	13.889	-.111**
Conservative - Economic	-.093	.036	-.162**			
Skeptic or belief predictors						
Often talk about it - Agree	.083	.041	.109*			
Often talk about it - Disagree				.063	.027	.120*
Belief Variable 1: Accepting evidence				.117	.049	.199*
Self-reported Knowledge predictor						
	.131	.049	.140**			
<i>R</i> ₂	.184			.161		
Adjusted <i>R</i> ₂	.125			.120		

N=602

* $p < .05$, ** $p < .01$, $p^{***} < .001$

Table 26. Multiple regression analysis of driving economically

Predictors	Driving Economically		
	<i>B</i>	<i>SE B</i>	β
Media predictors			
See News Story - Internet	.137	.062	.126*
See News Story - Newspaper	-.127	.054	-.135*
Skeptic or belief predictors			
Emotionally Responding	.170	.071	.173*
Self-reported Knowledge predictor	.319	.063	.246***
<i>R</i> ²	.291		
Adjusted <i>R</i> ²	.241		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 27. Multiple regression analysis of reusing or repairing items

Predictors	Reusing or Repairing Items		
	<i>B</i>	<i>SE B</i>	β
Demographic predictors			
Conservative - Economic	-.099	.051	-.125*
Media predictors			
Attention to News Story - Radio	.166	.062	.166**
Self-reported Knowledge predictor	.183	.069	.142**
<i>R</i> ²	.144		
Adjusted <i>R</i> ²	.082		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 28. Multiple regression analysis of composting kitchen waste

Predictors	Composting Kitchen Waste		
	<i>B</i>	<i>SE B</i>	<i>β</i>
Demographic predictors			
Hispanic or Latino	20.831	7.310	.119*
Liberal - Social	-.129	.066	-.146*
Media predictors			
News Minutes – Social Media	-.322	.157	-.103*
See News Story - Radio	.169	.084	.132*
Self-reported Knowledge predictor			
	.198	.080	.135*
<i>R</i> ²	.112		
Adjusted <i>R</i> ²	.049		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 29. Multiple regression analysis of turning off water while brushing teeth

Predictors	Turning Off Water While Brushing Teeth		
	<i>B</i>	<i>SE B</i>	<i>β</i>
Media predictors			
News Minutes – Social Media	-.388	.167	-.115*
See News Story – Social Media	.145	.073	.123*
Skeptic or belief predictors			
Often talk about it - Disagree	.100	.046	.119*
<i>R</i> ²	.129		
Adjusted <i>R</i> ²	.069		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 30. Multiple regression analysis of writing letters to politicians

Predictors	Writing Letters to Politicians		
	<i>B</i>	<i>SE B</i>	<i>β</i>
Demographic predictors			
Other gender	21.815	7.056	.119*
Other race	38.969	14.528	.101**
Liberal - Social	-.089	.042	-.142*
Liberal - Economic	.150	.047	.203**
Media predictors			
Attention to News Story - Newspaper	.083	.041	.121*
See News Story - Radio	.176	.053	.194***
Skeptic or belief predictors			
Often talk about it - Agree	.124	.043	.146**
Emotionally Responding	.138	.058	.175*
<i>R</i> ²	.280		
Adjusted <i>R</i> ²	.229		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Table 31. Multiple regression analysis of protesting environmental issues

Predictors	Protesting Environmental Issues		
	<i>B</i>	<i>SE B</i>	<i>β</i>
Demographic predictors			
Native Americans	-47.093	21.482	-.080*
Other race	59.113	15.235	.142***
Liberal - Economic	.134	.049	.168**
Media predictors			
Attention to News Story - Newspaper	.122	.043	.164**
News Minutes – Social Media	-2.15	.105	-.090*
See News Story - Radio	.166	.056	.169**
Skeptic or belief predictors			
Often talk about it - Agree	.221	.044	.240***
Accepting Evidence	-.120	.053	-.166*
Self-reported Knowledge predictor	.166	.054	.147**
<i>R</i> ²	.322		
Adjusted <i>R</i> ²	.274		

N=602

* $p < .05$, ** $p < .01$, p *** $< .001$

Appendix A

Media Use and Climate Change Skepticism Survey

Q1 How many minutes per day do you spend on these forms of media for entertainment content? Please type the number of minutes you think you spend on the average day using these forms of media.

- Social media (6) _____
- Internet (7) _____
- Television (8) _____
- Radio (9) _____
- Newspaper (10) _____

Q2 How many minutes per day do you spend on these forms of media for news content? Please type the number of minutes you think you spend on the average day using these forms of media.

- Social media (1) _____
- Internet (2) _____
- Television (3) _____
- Radio (4) _____
- Newspaper (5) _____

Q3 We would like to know your perceptions of the typical source you might see on social media. Please tell us how you would rate the typical source whom you follow on social

media for the following characteristics. Please respond on a scale of 1 to 7 with 1 being "does not possess this characteristic" and 7 being "does possess."

	1 (Does not possess) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (Does possess) (7)
Expertise (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Competence (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honesty (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Goodwill (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall credibility (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 We would like to know your perceptions of the typical source you might see on the internet. Please tell us how you would rate the typical source whom you frequent on the internet for the following characteristics.

Q6 We would like to know your perceptions of the typical source you might hear on the radio. Please tell us how you would rate the typical source whom you hear on the radio for the following characteristics.

	1 (Does not possess) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (Does possess) (7)
Expertise (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Competence (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honesty (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Goodwill (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall credibility (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 We would like to know your perceptions of the typical source you might read in the newspaper. Please tell us how you would rate the typical source whom you read in the newspaper for the following characteristics.

Q9 How often do you see entertainment stories about climate change while on these forms of media? Please respond on a scale of 0 to 5 with 0 "being do not use," 1 being "very little," and 5 being a "great deal."

	0 (Do not use) (1)	1 (Very little) (2)	2 (3)	3 (4)	4 (5)	5 (A great deal) (6)
Social media (1)	<input type="radio"/>					
Internet (2)	<input type="radio"/>					
Television (3)	<input type="radio"/>					
Radio (4)	<input type="radio"/>					
Newspaper (5)	<input type="radio"/>					

Q10 How much do you rely on these forms of media for your source of entertainment? Please respond on a scale of 0 to 5 with 0 being "do not use," 1 being "very little," and 5 being "a great deal."

	0 (Do not use) (1)	1 (Very little) (2)	2 (3)	4 (4)	5 (A great deal) (5)
Social media (1)	<input type="radio"/>				
Internet (2)	<input type="radio"/>				
Television (3)	<input type="radio"/>				
Radio (4)	<input type="radio"/>				
Newspaper (5)	<input type="radio"/>				

Q13 When you see entertainment content about climate change while on these forms of media how much attention do you give the content? Please respond on a scale of 0 to 5 with 0 being "do not use," 1 being "very little," and 5 being "a great deal."

	0 (Do not use) (1)	1 (Very little) (2)	2 (3)	3 (4)	4 (5)	5 (A great deal) (6)
Social media (1)	<input type="radio"/>					
Internet (2)	<input type="radio"/>					
Television (3)	<input type="radio"/>					
Radio (4)	<input type="radio"/>					
Newspaper (5)	<input type="radio"/>					

Q14 For each of these networks how many hours per day do you spend watching news? We would like to know the total amount of time you spend watching news on their website or television broadcast.

	0 hours (1)	1 half hour (2)	1 hour (3)	1.5 hours (4)	2 hours (5)	2.5 hours (6)	3 hours (7)	3.5 hours (8)	4 hours (9)	4.5 hours (10)	5 hours (11)	5.5 or more hours (12)
ABC (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NBC (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CBS (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fox Network k (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSNB C (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fox News (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CNN (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other news provide rs (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q15 What is your political orientation? Please indicate on a scale of -5 to +5 with -5 being "very liberal" to +5 being "very conservative."

	-5 (1)	-4 (2)	-3 (3)	-2 (4)	-1 (5)	0 Neither (6)	1 (7)	2 (8)	3 (9)	4 (10)	5 (11)
On economic issues (1)	<input type="radio"/>										
On social issues (2)	<input type="radio"/>										

Q16 How much do you agree or disagree with the following statements about climate change? Please indicate on a scale of -5 to +5 with -5 being "strongly disagree" to +5 being "strongly agree."

The
evidence for
climate
change is
unreliable
(6)



There is too
much
conflicting
evidence
about
climate
change to
know
whether it is
actually
happening
and human
activity is
causing it
(7)



Climate
change is
too complex
for scientists
to make
useful
forecasts (8)



Too much
fuss is made
about
climate
change (9)



Floods and
heat-waves
are not
increasing,
there is just
more
reporting of
it in the
media these
days (10)



Many leading experts still question if human activity is contributing to climate change (11)



The media is often too alarmist about issues like climate change (12)



Talking about climate change is boring (13)



The thought of climate change fills me with dread (14)



Climate change is something that frightens me (15)



I feel a moral duty to do something about climate change (16)



Recent
floods and
heat-waves
in this
country are
due to
climate
change (17)

(((((O (((((

The effects
of climate
change are
likely to be
catastrophic
(18)

(((((O (((((

I consider
climate
change to be
an
unacceptable
risk (19)

(((((O (((((

Climate
change is
too
complicated
for me to
understand
(20)

(((((O (((((

I often talk
about
climate
change to
family or
friends (21)

(((((O (((((

It is difficult
to know
which
products are
better for the
environment
(22)

(((((O (((((

I need more
information
to form a
clear
opinion
about
climate
change (23)



Q17 How willing would you be to take these actions? Please respond on a scale of 0 to 7 with 0 being "not at all willing," 6 being "very willing", and 7 being "already took action."

Bought a
product to
save water
(e.g.
Hydro
Flask) (7)

Q18 How often do you take these actions? Please indicate on a scale of 0 to 3 with 0 being "never," 1 being "occasionally," 2 being "often," and 3 being "always."

	0 (Never) (1)	1 (Occasionally) (2)	2 (Often) (3)	3 (Always) (4)
Turn off lights when you're not using them (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive economically (e.g. accelerating gently) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walk, cycle, or take public transport for short distant trips (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use an alternative to driving like shopping online (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Car pool (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cut down on flying (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buy environmentally-friendly products (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat locally-grown food (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoid eating meat (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buy products with less packaging (e.g. not using produce bags) (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recycle (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Reuse or repair items instead of buying new (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compost your kitchen waste (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking short showers to save water (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turn off water while brushing your teeth (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Write to politicians about environmental issues (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take part in a protest about environmental issues (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 In your opinion, do you agree with the statement that you consume information about climate change to help you feel more secure in your beliefs? Please indicate on a scale of 0 to 10 with 0 being "disagree" to 10 being "very much agree."

- 0 (Disagree) (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)

- 8 (9)
- 9 (10)
- 10 (Agree) (11)

Q20 In your opinion, do you agree with the statement that you consume information about climate change to help you view different points about the issue? Please indicate on a scale of 0 to 10 with 0 "being disagree" to 10 being "very much agree."

- 0 (Disagree) (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)
- 8 (9)
- 9 (10)
- 10 (Agree) (11)

Q21 In your opinion, how knowledgeable are you on climate change? Please indicate on a scale of 0 to 10 with 0 being "not at all knowledgeable" to 10 being "very knowledgeable."

- 0 (Not at all knowledgeable) (1)

- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)
- 8 (9)
- 9 (10)
- 10 (Very knowledgeable) (11)

Q22 In your opinion, how willing are you to communicate your views regarding climate change during a face-to-face setting if you feel like your opinion is the minority? Please indicate on a scale of 0 to 10 with 0 being "not at all willing" to 10 being "very willing."

- 0 (Not at all willing) (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)

- 7 (8)
- 8 (9)
- 9 (10)
- 10 (Very willing) (11)

Q22 In your opinion, how willing are you to communicate your views regarding climate change during a face-to-face setting if you feel like your opinion is the minority? Please indicate on a scale of 0 to 10 with 0 being "not at all willing" to 10 being "very willing."

- 0 (Not at all willing) (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)
- 8 (9)
- 9 (10)
- 10 (Very willing) (11)

Q24 What is your age? We would like to know your age to the nearest year, if it has been six months since your last birthday, round up.

Q25 Which race do you most identify with?

- Hispanic or Latino (1)
- Black or African American (2)
- Native American or American Indian (3)
- Asian or Pacific Islander (4)
- White (5)
- Other (6)
- More than one race (7)

Q26 Which gender do you most identify with?

- Male (1)
- Female (2)
- Transgender (3)
- Other (4)

Q27 What is your academic standing?

- Freshman (1)
- Sophomore (2)
- Junior (3)
- Senior (4)

Q28 What is your major? If you don't have a major please type undeclared.

Q29 What is you minor? If you don't have a minor please type undeclared.

Q30 Please select the category in which your family's total household income falls under.

- 0.00-19,999.00 (1)
- 20,000.00-39,999.00 (2)
- 40,000.00-59,999.00 (3)
- 60,000.00-79,999.00 (4)
- 80,000.00-99,999.00 (5)
- 100,000.00-119,999.00 (6)
- 120,000.00-139,999.00 (7)
- 140,000.00 or above (8)