Ethical Frameworks of Our Moral Obligations to Climate Change: Advancing Policy through Philosophy

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Authorization to Submit Dissertation

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Abstract

Climate change is a multi-faceted, interdisciplinary problem and needs to be understood as such to be adequately addressed. In this dissertation, I look at the ethical aspects of climate change to understand how ethics plays a role in public opinions and perceptions, as well as the formation of policy.

I first consider whether individuals find certain ethical frameworks more appealing than others when used as reasons we should reduce the effects of climate change. After all, 'ethics' can be a vague term. If one were to frame an issue as 'ethical' there would be many ways to do this. In the same vein, it is unclear which ethical frameworks Americans make use of when considering climate change as an ethical issue. I consider three popular normative ethical frameworks.

There are three common frameworks by which once can justify a right action. Deontology focuses on following principles or one's duty; utilitarianism focuses on maximizing favorable outcomes (or minimizing unfavorable outcomes); and virtue ethics focuses on the moral agent's exemplification of excellent character. I use these three frameworks to frame messages about the individual's ethical obligation to reduce the effects of climate change. In a nationally representative survey (n=1,202) I gauge Americans' level of agreement to each statement, and determine which statement is most persuasive. By doing this, I investigate which ethical frameworks are most suitable for sub-groups of the American public. Results show that agreement with a deontological message is positively correlated with religiosity ($p \leq 0.01$). Further, with an increase in religiosity, there is a higher likelihood that a respondent will self-report that the deontological message is more persuasive than the utilitarian message ($p \leq 0.001$). These findings suggest that specific ethical frameworks have more persuasive appeal among some groups over others. I specifically show that there is an ethical reason to mitigate that the religious—a traditionally skeptical group concerning climate change—responds to.

Next, I further consider some nuances of Americans' perceptions of climate change as an ethical issue. I measure whether (1) climate change beliefs are seen as ethical, and whether (2) decisions made to address climate change are seen as exercises in moral decision-making. While seemingly counter-intuitive, it is possible to think climate change has ethical

ramifications without thinking it is human-caused or a serious problem. This and other findings are discussed, as well as what this means for future research.

Lastly, I consider how various ethical frameworks can change the structure of carbon mitigation policy by analyzing the Kyoto Protocol and the Paris Agreement. The former structures carbon mitigation with rule utilitarian appeals, the latter uses virtue ethics and an appeal to reputation. Both aim for international carbon mitigation, but each choose unique ethical frameworks to structure how this is to be achieved. Other groups appeal to ethical frameworks in their mitigation strategies as well. For example, C40 Cities Climate Leadership Group, a conglomeration of cities working together to make their cities more carbon neutral, appeals to virtue ethic ideas. Governments—whether knowingly or not—appeal to ethical frameworks to evoke change. Some frameworks might do this better than others, so I seek to uncover what the effects of using varying ethical frameworks in policy formation might be.

This dissertation exemplifies how ethics can influence climate policy structure, and therefore its potential adoptability and implementation. I also show how ethics can be used as a message framing device to increase acceptance of climate change messages among skeptical groups. Lastly, I give insight into some nuances and specificities of Americans' ethical perceptions of climate change. This research offers some new ways to use ethics as a tool to further understand and make applicable climate change ideas and objectives.

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Dedication

I dedicate this dissertation to everyone who decides to try. Sometimes trying is the hardest part.

“I can accept failure, everyone fails at something. But I can’t accept not trying.”

~Michael Jordan

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Introduction

> *"...we paid no attention to disciplinary boundaries; we blithely followed problems wherever they led. For better or for worse, I've never been able to shake this approach."*
>
> ― Alan Dowty (American author and professor)

While 97% or more climate scientists say that recent warming is mostly due to human interference with the earth system (Cook et al., 2013), only 62% of Americans believe this to be true (Gustagson, Bergquist, Leiserowitz, & Maibach, 2019). This incongruence led me to wonder what else might be affecting Americans' perceptions about climate change other than scientific evidence. There are many factors that can influence individual perceptions of climate change. These might include political orientation, attitudes of friends and relatives, community and personal identity, religion, trust in science, or trust in the message sender.

Around the same time that I was thinking about this incongruence in public perceptions of climate change, I was becoming increasingly interested in virtue ethics and how it might play a part in how people assess ethical problems or situations. In my own life, I tend to use virtue ethics to assess whether I am being a good person or committing a right action, and I wondered how many other people used this type of ethical framework to assess an ethical situation and, if they do not, what type of ethical framework *do* they use? My interest in virtue ethics paired with my interest in climate change perceptions birthed what would be the beginning of this research project.

When someone says, "climate change is *ethical*" or "I do not think X is an *ethical* action to take" what do they mean by the term 'ethical'? Does appealing to the broad term of 'ethics' evoke enough specificity to elicit intended meaning? While there is a small chance that we all

apply the same interpretations of 'ethics' to our lives, there is a greater chance that there is variance in these applications; we know little about how people interpret and apply ethical principles to certain situations, and it would be unwise to assume what these ethical principles are. For instance, a deontological claim may not come across as ethically persuasive to someone who predominantly assesses ethical situations using utilitarian ideals. A deontological claim might therefore be ineffective at evoking an intended response or, at the very least, sufficient understanding potential ethical ramifications. If the relevant ethical framework can be identified, it is preferable to a broad ethical claim—the more precisely we can target pre-existing values, the more likely our communication will be understood, agreeable, and persuasive.

I take the assumption that there are less and more appropriate ethical frameworks (more appropriate ones being those frameworks that mirror the way people *actually* assess ethical situations) and apply this idea to the individual's ethical obligation to reduce the effects of climate change. I do this to determine what the most persuasive ethical frames of climate change are, especially among those who are otherwise skeptical about climate change yet could be receptive to certain ethical claims. This research can be found in chapters one and two.

I follow this up by uncovering some nuances inherent to Americans' perceptions of climate change as an ethical issue. Topics I look at are (1) whether beliefs about the existence of climate change are seen as moral beliefs, and (2) whether decisions made to address climate change are seen as exercises in moral decision-making. While agreement to these statements are dissimilar across the American public and intra-demographically, I discuss how ethical perceptions of climate change can be held by various groups of people—even people who do

not think climate change is human-caused. This research and subsequent discussion can be found in chapter three.

Lastly, I consider how different ethical frameworks inform written policy. I compare the Kyoto Protocol to the Paris Agreement (both international climate treaties) to illustrate how the former uses rule utilitarian ideas to structure its policy, whereas the latter uses virtue ethics. Employing a different ethical framework changes the ethical structure of each policy, and this change could alter adoptability and implementation. Research on this topic can be found in chapter four.

My research shows how ethical frameworks can change the structure of climate treaties, and how—if we are aware of this possibility—we can purposefully use ethical frameworks to increase policy adaptability and implementation. Instead of having ethics answer *why* we should mitigate carbon, I focus on *how* ethics can help to structure these objectives. In this way, ethics can be used as a tool to operationalize objectives to address climate change. Understanding how Americans ethically interpret climate change will give a snapshot into the specificities of how ethics is seen in the American mind and how it might be effectively used in policymaking. With this information, we can get a better grasp of the current ethical climate and a starting point from which we can engage with others in conversations about ethical aspects of climate change.

The questions I seek to answer in this dissertation span multiple disciplines, and I use interdisciplinary methods to examine topics that cut across traditional fields of study. I do this to create "cognitive bridges" or accessibility between the disciplines to help inform contextual, complex, and complicated issues (i.e. climate change). I believe that for an issue like climate change, it will be increasingly necessary to support interdisciplinary methods to find solutions

to increasingly convoluted, multifaceted problems. Climate change inherently crosses disciplinary boundaries, so studying it as such is appropriate. In this dissertation, you will see a mixture of communication, psychology, experimental philosophy, statistics, climate change opinions, religious studies, and policy analysis. I specifically focus on the application of philosophy to other fields of study to answer questions that span disciplinary boundaries. How can philosophy help us understand how people think about climate change, help us effectively communicate ideas, and create policy and informed collaboration and communication streams?

Another research interest I have includes generating collaboration techniques to inform the policymaking process. While this research is not a part of the dissertation, it is a natural extension and fitting next step. I use Toolbox Dialogue Initiative[1] (TDI) workshops to introduce the ideas of ethical frameworks and their potential effects on policymaking. While I initially based these workshops off of theory, they can now be based in observational data from dissertation findings; workshops can additionally inform and enlighten dissertation findings.

This dissertation focuses on the contributions that philosophy can bring to policy analysis and the public perceptions of climate change. There is very little literature in the way of research to understand the varying effects different ethical frameworks have on (1) policy structure and analysis, (2) public perceptions of climate change, and (3) targeted message effectiveness. Because of this, my research fills in an interdisciplinary knowledge gap that will help further our understanding of climate change perceptions and policy and give new tools and methods to more adeptly address these topics and concerns.

[1] Originally created to discuss research assumptions across disciplines, I ran these workshops to understand how cross-disciplinary collaboration affects policymaker's understanding of ethics' use in policymaking. For more information on the Toolbox Dialogue Initiative, see http://tdi.msu.edu/workshops/.

Overall, this dissertation will answer the following questions:

1. How does ethics alter the structure of written policy and therefore its potential adoptability, implementation and effectiveness?
2. In what ways and under what circumstances is climate change seen as (a) an ethical belief and (b) an issue we are able to make ethical decisions about?
3. Which ethical framework—virtue ethics, deontology or utilitarianism—offers the most persuasive and agreeable reason to reduce the effects of climate change, and does this answer vary depending on which demographic group we are interested in?

Chapter 1: Climate Change Beliefs and Ethical Perceptions Across the United States: Deontological Message Framing for the Religious

Abstract

While climate change has been a scientific reality for years, the American public trails behind in its acceptance of it. It seems that for some, it takes more than a scientific understanding of climate change in order to entertain pro-climate change sentiments. Targeted message framing is one way to help to increase pro-environmental attitudes of skeptical groups if these messages appeal to pre-existing values. Here, I determine which ethical approach creates the most agreeable frame for the religious demographic. I frame messages of the individuals' ethical obligation to address climate change. I do this by employing one of three normative ethical approaches—deontology, utilitarianism, and virtue ethics—into the message frame. By conducting a nationally representative survey (n=1,202), I find that religiosity positively correlates with the deontologically framed mitigation message, but not the utilitarian or virtue ethics framed messages. This research adds to existing literature by demonstrating how certain ethical appeals are more agreeable than others among various demographic groups. These results show how we can be more inclusive in climate change messaging and by doing so, increase public support. Last, I offer policy implications.

KEYWORDS: climate change perceptions, ethical frameworks, message framing, religiosity

1. Introduction

In this paper, I analyze a survey (n=1,202) that is nationally representative across the United States. I ask respondents to report their level of agreement to statements about their ethical obligation to reduce the effects of climate change. These statements are framed using the three normative ethical frameworks of deontology, utilitarianism, and virtue ethics. The

results from this analysis show which type of ethically framed message resonates with the religious demographic.

1.1 Climate Science, Public Perceptions, & Message Framing

Ninety-seven percent of climate scientists agree that the majority of recent climate change is the result of anthropogenic interference with the climate system. Despite this, the American public remains divided on the issue (Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2013). While 72% of Americans say the earth is warming (Pew Research Center, 2015a), a reduced 68% think it is anthropogenically caused (J. Jones & Saad, 2017), and only 40% think it is a serious threat to the United States (Pew Research Center, 2013a). Such skepticism and uncertainty threaten the progression and advancement of carbon mitigation policy and management to reduce climate change-associated risks.

Communication is one technique that can work with science to dampen some of this skepticism and apathy surrounding climate change perceptions (Dixon, Hmielowski, & Ma, 2017; Nisbet, 2009). One way of accomplishing this is through the use of targeted message framing which can increase the agreeableness and relatability of climate change messages among skeptical groups (Dixon et al., 2017). By incorporating germane pre-existing values of these groups into our messages, the likelihood of message acceptance increases. It is therefore important to understand the effect of message framing on mitigation acceptance, as an incorrect frame could decrease positive reception of climate advocacy, whereas an appropriate frame could increase it.

1.2 Targeted Mitigation Messaging

Targeted message framing takes information and makes it meaningful and persuasive to the target group (Gamson & Modigliani, 1987; Nisbet, 2009). Frames are more persuasive when the characteristics and preferences of each group are reflected in the target message—this concept is called segmentation (Feinberg & Willer, 2013). Messages become more familiar and therefore less threatening to the message receiver's worldview if values are incorporated into messaging. Because of this, it is important to understand which appeals are salient among target groups to avoid unintentionally mis-framing messages and potentially polarizing attitudes further. By focusing on existing values and beliefs we can potentially amplify pro-environmental behavior and engagement among traditionally skeptical groups (Dixon et al., 2017; Markowitz & Shariff, 2012b; Schmid, Rivers, Latimer, & Salovey, 2008; Snow, Rochford, Worden, & Benford, 1986).

Ethical values are often among the most influential types of appeals, especially among those who identify as religious (Chen, Pillutla, & Yao, 2009; Feinberg & Willer, 2013; Lakoff, 1996). While the criteria one might use to assess what is 'right' or 'wrong' varies among individuals, the religious are bonded by a belief in a supernatural moral authority; because of this, they are likely to process ethical situations similarly.[2] Determining the ethical approaches

[2] Determining appropriate moral appeals has already shown to be an effective messaging tool for groups of varying political ideologies. For example, studies show that many environmental problems are framed using the moral values of harm/care, as described by Moral Foundations Theory (Jesse Graham et al., 2009). These values often appeal to a liberal, rather than conservative base. Environmental messages are not often framed using the additional conservative values such as authority, loyalty, and sanctity, which partially accounts for the lack of environmental support among conservatives. Feinberg and Willer (2013) have shown that when these conservative values are incorporated in framing environmental issues, there is no difference in environmental attitudes among liberals and conservatives. This research supports the idea that ethical message framing can unify environmental attitudes. By uncovering which ethical appeals persuasively amplify pro-environmental attitudes, acceptance of environmental advocacy efforts could find favor among more skeptical groups (Anthony Leiserowitz et al., 2016; Stern et al., 1999).

the religious community uses to process ethical situations can help determine how to frame a persuasive and acceptable ethical message for this group.

1.3 Considering Three Ethical Frameworks

Deontology, utilitarianism, and virtue ethics are often considered the three most common ethical approaches in philosophy. Deontological ethics highlights the adherence to one's duty; utilitarianism emphasizes the maximization of favorable consequences; and virtue ethics stresses the commitment to being a virtuous person (Bunnin & Tsui-James, 2003). Each framework emphasizes a different facet of ethics and consists of unique ethical reasoning. Oftentimes, the same outcomes can be ethically supported by any or all of these frameworks. The following example explains how this can be true: Imagine, upon meeting a destitute stranger, you give him money based on deontological ideas: it is our duty to give money to people in need based on the maxim,[3] "do unto others as you would have them do unto you." Conversely, you may give money based on utilitarian reasoning: the loss of five dollars will not harm you nearly as much as it will increase this stranger's wellbeing. Or perhaps you give him the money based on virtue ethical ideas: a compassionate and caring person would give money to this stranger, who is obviously hungry and cold. Since you are genuinely interested in lessening others' hardships, you give him the money.

As shown by the above scenario, it is possible to employ different ethical reasonings to reach the same outcome. Similarly, any one of these ethical frameworks could be used to justify the act of mitigating carbon emissions. For example, justifying the need to address climate change based on the diminution of negative consequences that would otherwise occur, is a utilitarian supplication. Alternatively, justifying the need to address climate change because it

[3] Maxims are universal principles or rules of conduct. They can also be thought of as expressions of general truths.

is our duty to do so is a deontological appeal. And lastly, one might justify addressing climate change because it is what people of good character do, and we are people of good character—this is an appeal to virtue ethics. From here, I go into more specificity about each ethical framework.

1.3.1 Deontology

Deontology, most popularly associated with the philosopher Immanuel Kant, focuses on the concept of following one's duty or complying to universal principles (Bunnin & Tsui-James, 2003; Kant, 1781, 1785, 1793). Typically, the moral agent's duty to commit an act is regardless of the consequences of the resultant act. Acts are right or wrong in themselves—in this way deontological reasoning is incompatible with utilitarian reasoning (Honderich, 2005). For example, breaking a promise is wrong in itself, [4] even if more favorable outcomes could occur by breaking the promise. Again, this is due to the rightness of an action being based on adherence to a foundational maxim rather than on the consequences of the action. Moral agents commit to maxims they can simultaneously will to be universal law.[5] Examples might include common directives such as, "do unto others as you would want them to do to you," "do not cheat," or, "always tell the truth." While the precise consequences of following such maxims might be unclear, the moral agent does not have to consider consequences to be ethical; it is ethical simply to act according to principle.

Deontology additionally advocates for inalienable rights: regardless if two people's lives could be spared by killing one, killing a human is never an ethically permissible action according to deontology because humans maintain the right to life. Climate change jeopardizes

[4] In this case, if it is the moral agent's duty to keep his or her word.

[5] This is known in deontology as the Categorical Imperative, espoused by Immanuel Kant, a forerunner of deontology. The Categorical Imperative is, "one which represent[s] an action as objectively necessary for itself, without any reference to another end" (Kant, 1785).

the human right to life, health, and subsistence; because of this, mitigation is concerned with human rights (Caney, 2010).

1.3.2 Utilitarianism

Jeremy Bentham and John Stewart Mill are the forerunners of utilitarianism, the former considering the amount of an individual's pleasure, the latter additionally considering the quality and type of that pleasure (Bentham, 1907; Mill, 2015; Mill & Bentham, 1987; Mill & Crisp, 1998). Today, utilitarianism is the most common form of consequentialism,[6] and typically espouses the best action as one that maximizes overall wellbeing or happiness (rather than just pleasure), when comparing this action to all other possible actions (Honderich, 2005). Utilitarianism then, asserts that the rightness or goodness of any action depends upon its consequences or doing the "greatest good for the greatest number of people" (Perry, 2014). This can be done, for example, by abating actions that would otherwise harm others or by minimizing the potential of unfavorable outcomes. The Greatest Happiness Principle states that, "actions are right as they promote happiness, wrong as they tend to produce the reverse of happiness" (Mill, 2009). Utilitarianism, then, would not condone the following of rules unless in doing so the resultant action maximized favorable outcomes. Because climate change is expected to cause outcomes that will bring harm to people, reducing the effects of climate change would assist in reducing these harmful consequences.

1.3.3 Virtue Ethics

Virtue ethics is the third approach of normative ethics, and has only relatively recently risen to prominence due to Anscombe's contribution of *Modern Moral Philosophy*, followed

[6] Utilitarianism is a specific type of consequentialism. Consequentialism in its purest form only looks at the consequences of actions to determine rightness or wrongness. Utilitarianism specifies this by detailing what consequences we should care about, such as pain and pleasure or well-being and harm (Honderich, 2005).

by others such as Alasdair MacIntyre's *After Virtue*, Paul Ricoeur's *Oneself as Another,* and Philippa Foot's *Virtues and Vices* (Anscombe, 1958; Foot, 2002; Hursthouse & Pettigrove, 2016a; MacIntyre, 2007; Ricoeur, 1992). Traditional accounts are given by Plato and more popularly, Aristotle (Aristotle, 340BC; Berges, 2009; Hursthouse, 1999).

Virtue ethics is unique because it is agent-relative—the same cannot be said of utilitarianism or deontology. The moral agent's intentions, which are wrapped up in virtues or the outflowing of character, matter to the action at hand. The goodness of an action, therefore, would depend on the moral agent's disposition and, "settled state of character"[7] (Hursthouse, 1999; Perry, 2014). The moral agent should seek to cultivate good virtues, where virtues are excellent character traits (Hursthouse & Pettigrove, 2016a). Instead of outwardly determining what rules one should follow or what actions would make for the best consequences, virtue ethics requires the moral agent to look inwardly to determine what a person of excellent character might do. For example, a virtuous person would not commit a selfless act because they know it to be selfless, but rather because they are genuinely interested in helping those in need of assistance (Crisp, 2010). This is not due to some version of utility calculus or an ethical duty. Actions and intentions go hand in hand. Therefore, the moral agent could commit a 'right' action for the 'wrong' reason under a virtue ethics framework but not under a utilitarian or deontological framework. Someone could be ethically motivated to reduce the effects of climate change, for example, because it is what a person of excellent moral character would do.

1.4 Message Framing for the Religious in America

The religious as a group are divided on their climate change views, and studies do not offer consistent findings. For instance, those with "strongly traditional religious beliefs" and

[7] This settled state of character would arise from reason rather than emotion (Hursthouse, 1999).

born-again Evangelicals[8] are over-represented in groups with lower belief in and concern about climate change (Anthony Leiserowitz, Roser-Renouf, Maibach, Feinberg, & Rosenthal, 2016). Further, concern about climate change can vary by denomination or religious group (R. P. Jones, Cox, & Navarro-Rivera, 2014), though some studies find no correlation between religious affiliation and climate change concern (Kilburn, 2014). Evangelical Protestants who attend religious services frequently are found to be, "distinctively more concerned about the effects of climate change" (Kilburn, 2014), but this is counter to other research showing Evangelical Protestants to be more skeptical about climate change than the religiously unaffiliated (Ecklund, Scheitle, Peifer, & Bolger, 2017), and that church attendance and being born-again predict one's willingness to loosen environmental controls in favor of economic growth (C. L. Kanagy & Nelsen, 1995). Another study found that Biblical literalism and religious service attendance lead Americans to think climate change is naturally caused and to have less concern about it (Kilburn, 2014). Further, Biblical literalism, belief in God, and being Christian have been found to be negatively correlated with environmental concern (Greeley, 2017).

Confounding some of this research are findings that stewardship and biblical inerrancy are significant predictors of private pro-environmental behaviors (Baylor & Brandhorst, 2015). Similar findings show that, among Christians, religiosity is positively correlated to pro-environmental behaviors but not pro-environmental attitudes or beliefs (Clements, McCright, & Xiao, 2014). An interview-based study also found that, among 42 interviews of religious-environmental organizations in the United States, "the majority…see themselves as engaged in an ethics-based environmentalism grounded in frameworks that tie God to nature and

[8] See McCammack (2007) for an overview of the literature on Evangelicals and climate change.

emphasize action, community, and justice" (Pulver & Smith, 2013). Religion's effect on climate change perceptions and environmentalism is obviously far from settled or unified. For further review, see Posas (2007), which gives a historical as well as current examination of climate ethics within the religious context.

Despite the inconclusiveness of these findings, framing mitigation messages by appealing to the existing ethical values of the religious can help to unify views and increase pro-environmental attitudes (Markowitz & Shariff, 2012b). This type of framing could have particular resonance in the United States, where over half of Americans (54%) say that religion plays a "very important" role in their lives (Gao, 2015). The United States also tends to be more religious than other industrialized nations; as a country it ranks highly in religiousness and belief in creationist ideas (Anthony Leiserowitz et al., 2016; Paul, 2010). Because of this, Americans could be particularly receptive to religious or ethical framings of climate change.[9] Further and more importantly, ethical framing could, "reach segments of the U.S. public that have yet to engage with the climate change issue" (Anthony Leiserowitz et al., 2016). It is likely that most effective ethical message in this case will be one that incorporates an ethical framework that is familiar and common to the religious community. In what follows, I demonstrate why the American religious community should be more likely than those who are non-religious to agree with deontologically framed messages.

[9] Considering ethical dimensions can help people to gain mutual understanding and find a way to progress forward. Despite there being various ways to ethically assess a given situation, "a convergence of ethical conclusions about some climate change issue is possible" (Posas, 2007). I research if there is a "convergence" among the religious community in the United States.

1.5 The Deontological Appeal and the Religious

Religiosity measures how important religion is to an individual,[10] though there are several definitions of the term. Some of these definitions include: belief in God, following the principles one believes to have been set by God (McDaniel & Burnett, 1990), or simply as "the personal practice of religion" (Gordon W. Allport & Ross, 1967). Prior research has shown a positive correlation between religiosity and ethical belief. For example, those who attend worship services more often are less likely to cheat on a task than those who attend services less often (Bloodgood, Turnley, & Mudrack, 2008). Another study found that intrinsic religious orientation is positively correlated to augmented ethical behavior in nurses (Hassanian & Shayan, 2017). It has also been suggested that strength of religious beliefs can alter business decisions concerning ethical issues, in that these beliefs increase concern for ethical issues (J. Vitell, 2009). Religiosity has also been shown to negatively correlate with willingness to behave unethically[11] (Kennedy & Lawton, 1998). Based on these findings, religious individuals tend to be particularly receptive to ethical appeals—a compelling assumption as religious teachings and scriptures across religions emphasize the importance of ethical practices (Singh, 2001).

Banerjee, Huebner, and Hauser (2010) found that, "religious…backgrounds have frequently been treated as critical actors in motivating morally relevant behavior and providing a structure for morally relevant decisions. It is commonly held that religion is necessary, if not

[10] I assume that the measure I use to capture religiosity captures the intrinsic dimension of religiosity rather than the extrinsic dimension (G.W. Allport, 1950; Gordon W. Allport & Ross, 1967; J. Vitell, 2009). The intrinsic dimensions refers to, "motivations based upon the inherent goals of religious tradition itself," (J. Vitell, 2009) and a sincere incorporation of faith and religious beliefs into one's life (Shelby D. Hunt & Vitell, 2006), while the extrinsic dimension refers to, "utilitarian motivations that might underlie religious behaviors" (J. Vitell, 2009) and a "source of comfort, social support, self-justification, and/or status" (Shelby D. Hunt & Vitell, 2006). For more information, please refer to section 4, Limitations and Future Research.

[11] There are several other studies showing the relationship between measures of religiosity and increased ethical behavior (Kurpis et al., 2008; S. J. Vitell & Paolillo, 2003; S. J. Vitell, Paolillo, & Singh, 2005; Walker, Smither, & Debode, 2012).

synonymous with morality; on this view, scripture provides the source of moral judgments and the impetus for morally commendable behavior." Religious individuals learn and draw upon their ideas about ethics and morality from their religions. It shapes the way they see the world and the way they process information. This encompasses the ethical decision-making process as well as how the individual decides whether an issue is ethically significant or valid (Ferrell & Gresham, 1985; S. D. Hunt & Vitell, 1986; Piazza, 2012; Terpstra, Rozell, & Robinson, 1993; J. Vitell, 2009). Further, a substantial body of research demonstrates that religious and non-religious people make these ethical decisions fundamentally differently (Goodwin & Darley, 2008; J. Graham & Haidt, 2010; Piazza, 2012; Piazza & Sousa, 2014; Tetlock, 2003). While religious individuals rely on deontological judgements to navigate ethical dilemmas (Barak-Corren & Bazerman, 2017; Conway & Gawronski, 2013; Piazza, 2012; Piazza & Sousa, 2014; Szekely, Opre, & Miu, 2015; Tetlock, 2003), non-religious individuals characteristically prefer forms of utilitarianism (Banerjee, Huebner, & Hauser, 2010; Piazza & Landy, 2013). This difference is attributed to the divergent evaluative preferences of each group. The religious tend to evaluate ethical actions based on whether they are in accordance with certain norms,[12] rather than whether they optimize perceived or actual consequences (Banerjee et al., 2010; Conway & Gawronski, 2013; Piazza, 2012; Piazza & Sousa, 2014). As one study explains, "major organized religions provide guidance on moral issues and communicate the expectation that their adepts will adhere to moral norms" (Kurpis, Beqiri, & Helgeson, 2008). Theologically speaking, religious practitioners often rely upon the divine authority of God (Piazza & Sousa, 2014). If humans are incompetent at making ethically acceptable decisions due to something

[12] Deontological judgments have some interpersonal benefits over other ethical appeals, such as displaying strong moral conviction, empathy, and good character, especially in ethically difficult circumstances (Piazza & Sousa, 2014; Uhlmann, Zhu, & Tannenbaum, 2013).

like original sin (as found in Abrahamic religions), then divinely appointed moral rules would be required to make good decisions (Piazza & Landy, 2013).

Almost all religions, including some indigenous religions, contain divine law that is often central to the religion (Kelsay, 2012). Jewish people have the Torah, which contains 613 obligations, or mitzvahs, that are mandated by God and required of all Jews (Kelsay, 2012; Zohar, 2012). The Islamic religious law Shari'a contains personal, social, and political rules, and is even used as a legal system (Zohar, 2012). Within Buddhism, Dharma is a moral law that "must be followed and deeply understood if an individual is to attain enlightenment (P. S. E. Green, 2012). Hinduism's concept of law, also called Dharma, gives rules for appropriate behavior by social class and at each stage of life (Madan, 2012). The preference for following rules or laws set by a divine authority (also representative of Divine Command Theory) or following one's duty are representative of a deontological appeal (A.F. Shariff, 2015; Azim F. Shariff, Piazza, & Kramer, 2014).

A current example of deontological appeals eliciting attitude change among the religious community can be found in Pope Francis's encyclical on climate change, *Laudato Si': On Care for Our Common Home.* In it he states, "the work of the Church seeks…to remind everyone of the *duty* to care for nature," and that, "[each community] has the *duty* to protect the earth and to ensure its fruitfulness for coming generations" [emphasis added] (Pope Francis, 2013). The Pope calls for protection and preservation of the environment because it is the individual's duty. While there are other appeals that he could have used such as the appeal to one's good character in caring for the environment or to the improved consequences of protecting the environment, he rather says that caring for nature is one's *duty*—a moral responsibility or obligation, and a powerful entreaty. This deontologically framed appeal altered

Americans' views on climate change as well as their trust in the Pope;[13] these trends were not confined to the Catholic or religious community, but were seen broadly among the American public (Maibach et al., 2015). This occurrence has since been named the "Francis Effect" because of its measurable influence on public attitudes (Anthony Leiserowitz et al., 2016).

A deontological framework is suspected to play such an integral role in the religious practitioner's life that it cannot be separated from the decision-making process when analyzing an ethical claim.[14] Vitell and Hunt (2006) corroborate the sentiment that religious individuals are necessarily more familiar with deontological norms than non-religious individuals:

> Religion undoubtedly shapes the worldview of those who are devout to their religions. The more religious people are, the more they have incorporated the importance of their religions into their lives. Unquestionably, an individual's personal religion influences ethical decision making. A priori, compared with nonreligious people, one might suspect that (1) highly religious people would have more clearly defined *deontological* norms and that (2) such norms would play a stronger role in ethical judgements" [emphasis added] (Shelby D. Hunt & Vitell, 2006).

Framing carbon mitigation messages with pre-existing values should appeal to the religious community more than other types of ethically-framed messages even if segments of this demographic do not traditionally support climate change advocacy. Therefore, religiosity should be positively correlated with agreement to a deontologically framed message of an ethical obligation in general, and an obligation to reduce the effects of climate change in particular. I do not expect to find a correlation between religiosity and the other two ethical

[13] In that, their trust in the Pope increased. It might be said that this increased trust was partially due to the Pope acknowledging the existence of anthropogenic climate change.

[14] The relationship between religiosity and deontological judgement cannot be attributed to psychological factors separate from religious belief. Further, general concern for authority, loyalty, or sanctity (posited by Moral Foundations Theory), political conservatism, intuitive thinking style, or general conservativeness cannot fully explain the relationship between religiosity and deontology (J. Graham & Haidt, 2010; Laurin, Shariff, Henrich, & Kay, 2012; Piazza, 2012; Piazza & Landy, 2013; Piazza & Sousa, 2014; Shenhav, Rand, & Greene, 2012). Neither can it be accredited to a need for structure, cognitive simplicity, or a submission to authority (Barak-Corren & Bazerman, 2017; Piazza, 2012).

frameworks of utilitarianism and virtue ethics because, while both provide ethical reasoning to mitigate, neither are as common of an appeal as deontology among this demographic, nor are they as familiar or integrated as deontology is.[15]

My hypothesis is:

> **Hypothesis:** The more religious respondents are, the more likely they are to agree with a *deontologically*-framed message of their ethical obligation to mitigate carbon emissions.

2. Data Measurement and Operationalization

I administered this survey with Survey Sampling International in February of 2018, in which I collected 1,202 responses representative across the United States.[16] I created the survey in Qualtrics and it is exempt under Institutional Review Board Protocol 17-075. The survey offers respondents statements that give various ethical justifications for the need to address climate change. Respondents were then asked to rate their level of agreement to each statement. A standard battery of demographic questions was also collected.

2.1 Dependent Variables

Dependent variables shown in Table 1.1 measure via unique ethical frames, whether and to what extent respondents believe they have an ethical obligation to mitigate their carbon emissions.[17] The statement that uses a deontological frame is based in the moral agent's duty to

[15] While there is a substantial body of research showing religious individuals' preference for deontological thinking over utilitarian thinking, there is much less research (possibly none) that has explored the potential preference of the religious for virtue ethical thinking. Virtue ethics is tested in this study because it is of the three normative ethical frameworks alongside deontology and utilitarianism. Less work has been conducted to understand virtue ethics' relationship to the ethical thought process. This study determines how it ranks along with deontology and utilitarianism, and how virtue ethics ideas might be understood in a climate change context. It is assumed that virtue ethics will be not be correlated to religiosity because there lacks enough quantitative research to suggest a preference for such a thinking style among this demographic. This being said, some religions do appeal to virtue ethic ideas within their texts, so the term should not be an entirely alien idea.

[16] Refer to *Appendix 5. Nationally Representative Survey Data* for a comparison of survey data to census data.

[17] Theory in the area of ethical message framing related to climate change—specifically using these ethical frameworks—is underdeveloped. Therefore, there are inherent limitations in the ability to validate these measures.

uphold justice and protect individual rights. The statement is: "We have a duty to protect the rights of people who will be affected by climate change," and will be referred to as *duty*. The second statement employs a utilitarian frame. I base the reasoning of this statement on mitigation's ability to minimize the harm that climate change will cause. It is representative of utilitarianism because the most preferred outcome[18] in any situation is one that maximizes the best outcomes or minimizes harmful outcomes. The statement is: "Harm will come to people if we do not reduce the effects of climate change," and will be referred to as *harm.* To capture the virtue ethics frame of one's ethical obligation to mitigate I appeal to the moral agent's character, as agent motives are a key aspect of virtue ethics. The statement I use is: "Reducing the effects of climate change reflects our character and who we strive to be," and I refer to this statement as *character*. Response options for these statements are: (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, or (5) strongly agree.[19] I analyze responses to these variables in Statistical Package for Social Scientists (SPSS) using multiple linear regression analysis.

2.2 Independent Variables

2.2.1 Predictor Variable

The predictor variable, found in Table 1.1, measures religiosity and is ordinal. I ask respondents: "How important is religion in your life?" Answer options are (1) not at all important, (2) not too important, (3) somewhat important, or (4) very important. This is a commonly referred to measure of intrinsic religiosity, with many studies using identical or near

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As more research conducted in this specialized field becomes available, results and methodologies should be compared and improved upon.

[18] Anthropocentrically speaking

[19] For Pearson's correlations of the dependent variables, refer to *Appendix 4. Pearson Correlations of Dependent Variables*. For further defense of the creation and measurement of the dependent variables (including using single-item measures), see *4. Limitations and Future Research.*

identical wording[20] (Bobowik et al., 2010; Kurpis et al., 2008; La Barbera & Gürhan, 1997; Rice & McAuliffe, 2009).

2.2.2 Control Variables

I include several control variables: age, education level, income, gender, race, Hispanic heritage, political ideology, religion (including Evangelicalism), perceived seriousness of climate change as a problem, and existence of climate change.

Age: Research shows that younger individuals are more likely than older individuals to think climate change is anthropogenically caused (Pew Research Center, 2015a, 2018). I expect there to be a higher likelihood that younger adults will be positively correlated to one or more of the dependent variables than older adults. Age is an ordinal variable with response options in one year increments. Higher values correspond to older individuals.

Education Level: Internationally, education is a good predictor of climate change awareness and risk perceptions (Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015), though one study shows this might not be the case in the United States. Within the United States, Republicans with more education are more likely to think the seriousness of global warming is exaggerated (Newport & Dugan, 2015). Conversely, the more education Democrats have, the less likely they are to think that the seriousness of global warming is exaggerated, and are therefore more likely to worry about it[21] (Newport & Dugan, 2015). The demographic question used to capture education level is, "What is the highest level of school you have completed or the highest degree you have received?" Response options are (1) less than high school, (2) high school incomplete, (3) high school graduate, (4) some college, no degree, (5) two-year associate

[20] For further justification of the predictor variable see *4. Limitations and Future Research.*
[21] Further research corroborates that more education does not lead to a greater concern for climate change among Republicans (Kahan et al., 2012; McCright, 2016).

degree from a college or university, (6) four-year college or university degree/Bachelor's degree, (7) some postgraduate or professional schooling, no postgraduate degree, (8) postgraduate or professional degree, including master's, doctorate, medical or law degree.

Annual Income: While research is mixed, some studies have shown that income is a positive predictor of belief in and knowledge of climate change (Hornsey, Harris, Bain, & Fielding, 2016). Other studies show that while this might be true, income is negatively correlated with how serious of a risk one believes climate change to pose (Bohr, 2014). Because research is mixed, I do not expect annual income to correlate with the dependent variables. Respondents are asked, "Last year, what was your total family income from all sources, before taxes?" Standard response options were used, with higher values representing higher incomes.[22]

Gender: Research shows that women are typically more knowledgeable and concerned about climate change and environmental risks than men (McCright, 2010; Xiao & McCright, 2012). For these reasons women should be more likely than men to agree with the dependent variables, but there lacks sufficient research to assume women would be drawn to one ethical framework over others. This ordinal variable is coded as (0) men and (1) women.

Race: While there are mixed results on the effect of race, some literature shows that non-whites are more strongly in support of policy to reduce greenhouse gas emissions than whites (A. Leiserowitz & Akerlof, 2010). Additionally, a higher percentage of blacks than whites say that climate change is anthropogenically caused (Pew Research Center, 2015b). For these reasons, it is more likely that non-whites will be positively correlated to the dependent variables than whites, if correlated at all. I coded race as a categorical variable (dummy variable), in which categories are white, black, Asian, and mixed/other.

[22] The lowest coded variable is "Less than $10,000." Options are in increments of $9,999 up until $99,999. The second-highest coded variable is "$100,000-$149,999," and the highest is "More than $150,000."

Hispanic Heritage: Nine out of 10 Hispanics support climate action, and their concern for climate change advocacy is second only to their support of immigration reform (Natural Resources Defense Council & VOCES, 2016). Hispanics are more likely to think that global warming is happening and are also more likely to think it is anthropogenically caused than other groups (A. Leiserowitz et al., 2017; Anthony Leiserowitz, Rosenthal, & Cutler, 2017). I expect Hispanic heritage to be positively correlated to the dependent variables. Hispanic heritage is an ordinal variable with responses coded as (0) Hispanic and (1) non-Hispanic.

Political Ideology: Political ideology is a strong predictor of whether Americans believe in climate change, believe it is anthropogenically caused, and believe it to be a serious problem (Pew Research Center, 2013b, 2015a, 2016). For example, 70% of liberal Democrats trust climate scientists, compared to only 15% of conservative Republicans (Pew Research Center, 2016). Seventy-nine percent of liberal Democrats agree that the earth is warming mostly due to human activity, compared to 63% of moderate/conservative Democrats, 24% of moderate/liberal Republicans, and 15% of conservative Republicans (Pew Research Center, 2016). I coded political ideology as an ordinal variable with "very conservative" being the lowest coded number, and "very liberal" being the highest. Based on these findings, I expect a strong positive correlation between all dependent variables and political ideology. Specifically, the more liberal a respondent is the more likely they will agree with all statements ethically framing the need to address climate change. I base this on the idea that, because liberals are more likely to believe in anthropogenically-caused climate change and find it to be a serious problem, any statement asserting the individual's ethical obligation to address climate change should strongly resonate with this group. Political ideology is so strongly correlated to belief in

climate change that any number of ethical reasons to address climate change should come across as agreeable.

Evangelicalism: Evangelicalism is sometimes negatively correlated with belief in anthropogenic climate change (Ecklund et al., 2017; Pew Research Center, 2015b). For this reason, I expect Evangelicalism to be negatively correlated to the dependent variables when compared to non-Evangelical Christians. Evangelicalism is a categorical variable coded as (0) Evangelical, and (1) not Evangelical.

Existence of climate change: I ask respondents what their beliefs about climate change are, assuming that those who think climate change is human-caused will be more likely to believe that they have an ethical obligation to mitigate. It follows that there would be less of an ethical obligation to mitigate if climate change was naturally caused, and no ethical obligation to mitigate if climate change did not exist. I suspect that belief in anthropogenic climate change will be positively correlated to all three dependent variables because any ethical reasoning would come across as a strong motive to mitigate to this group. I ask, "which of these three statements about the earth's temperature comes closest to your view?" Response options are: "The earth is getting warmer mostly because of human activity such as burning fossil fuels," "The earth is getting warmer mostly because of natural patterns in the earth's environment," and, "There is no solid evidence that the earth is getting warmer." I coded existence of climate change as a categorical variable, in which the categories are "human-caused climate change," "naturally caused climate change," and "climate change not happening."

Perceived seriousness of climate change: Similar to the "existence in climate change" variable, I additionally ask respondents how serious of a problem they think climate change is. Perceived seriousness should be positively correlated to belief in anthropogenic climate change,

and for that reason, should also be positively correlated to all the dependent variables. In theory, if climate change is a serious problem, there would be more of a reason to mitigate than if it was seen as "not too serious a problem" or "not a problem at all." I ask respondents, "In your view, how serious a problem is climate change? Is it a…" Response options are: "very serious problem," "somewhat serious problem," "not too serious a problem," and, "not a problem." I coded "perceived seriousness of climate change" as an ordinal variable with "not a problem" being the lowest coded number and "very serious problem" being the highest.

3. Results and Discussion

For a comparison, Figure 1.1 shows results of responses to each ethical framework statement. 67.4% of respondents "agree" or "strongly agree" with the *harm* statement, 66.7% "agree" or "strongly agree" with the *duty* statement, and 55.7% "agree" or "strongly agree" with the *character* statement. Accordingly, the majority of respondents agree with each framing of their ethical obligation to mitigate carbon emissions.

Next, I conducted a series of linear regression analyses using the variables described.[23] As found in Table 1.2, for a one unit increase in religious importance, I observed an increase of 0.078 scale points in agreement with the *duty* statement ($p \leq 0.01$). This is in support of the hypothesis that the more religious someone is, the more likely they are to agree with a deontological framing of their ethical obligation to mitigate. This was expected because religious individuals are likely to draw upon deontological commitments when processing ethical information. It can additionally be noted that the *harm* and *character* statements had a

[23] I control for the possibility that respondents do not see these statements as ethical. See *Appendix 1. Control Variables of Chapter 1* for further explanation. Tests of robustness of the results can be found in *Appendix 2. Tests of Robustness for Chapter 1*. Pearson correlations of the independent variables can be found in *Appendix 3. Pearson Correlations of Independent Variables of Chapter 1.*

directionally positive relationship to religiosity as well but were not significant at the ($p \leq 0.05$) level.

As found in Table 1.3, religiosity was also compared to "perceived seriousness of climate change," which was tested as a dependent variable—these were correlated at the ($p \leq 0.05$) level. The same test was conducted with "belief in climate change as human-caused" as the dependent variable, though there was no correlation between religiosity and a belief in human-caused climate change. While there is no correlation between religiosity and belief in human-caused climate change, a correlation between religiosity and the *duty* statement still persists. Therefore, agreeing that we have a duty to protect the rights of people affected by climate change is not reflective or indicative of general belief in anthropogenic climate change. Further, the ethical statement employing deontological reasoning overcomes the lack of relationship between religiosity and belief in anthropogenic climate change, pointing to the power of the deontological frame among the American religious community.

Religious non-Christians are more likely than Christians to agree with the *harm* statement, though a stronger and more significant difference is found between non-Evangelical Christians and religious non-Christians rather than Evangelical Christians and religious non-Christians.[24] Further, there is no statistical difference between how non-Evangelical Christians and Evangelicals respond to any of the ethical statements. As seen in Table 1.3, this is further confounded by non-Evangelical Christians being more likely to think climate change is a serious problem than Evangelicals ($p \leq 0.05$). These findings are partially counter to predictions[25] and literature showing that Evangelicals are often more resistant to pro-climate

[24] Christian Evangelicals: 0.175 scale point increase at the ($p \leq 0.05$) level. Non-Evangelical Christians: 0.233 scale point increase at the ($p \leq 0.01$) level.

[25] It was predicted that Evangelicals would be less inclined to agree with the ethical statements than non-Evangelicals Christians.

change ideas than non-Evangelical Christians are (though the literature is mixed and varies depending on Evangelical group) (Ecklund et al., 2017; C. L. Kanagy & Hart, 1995; Kearns, 1997; Kilburn, 2014; Anthony Leiserowitz et al., 2016; Markowitz & Shariff, 2012a; McCammack, 2007; Zaleha & Szasz, 2015). The current study demonstrates that there are further nuances to this narrative and future research should consider more in-depth analyses of Evangelicalism's relationship to climate change ethics.

Non-religious individuals do not answer any of the ethical statements statistically differently than religious individuals (Christian or otherwise), but the non-religious are more likely than the religious to think climate change is a serious problem ($p \leq 0.01$). No group[26] is any more or less likely than another to think climate change anthropogenically caused, or that it is not happening.

Results additionally show significant correlations with some of the control variables. For example, with a one unit increase in political ideology (more liberal), there is a 0.078 scale point increase in agreement with the *harm* statement ($p \leq 0.001$), a 0.119 scale point increase in agreement with the *duty* statement ($p \leq 0.001$), and a 0.099 scale point increase in agreement with the *character* statement ($p \leq 0.001$). This is as predicted—liberals are more receptive than conservatives to all ethical frames of the individual's obligation to address climate change because they are already more receptive to pro-climate change ideas in general. It should also be noted that the *duty* statement has a stronger directionally positive relationship to political ideology than the *harm* or *character* statements do. This partially supports past research that liberal political orientations are positively correlated to a consequentialist framework (Piazza & Sousa, 2014), but additionally shows that a deontological and virtue ethic framework are

[26] That is, among the non-religious, religious non-Christian, non-Evangelical Christians, and Evangelical Christians.

correlated when linked to the need to address climate change; further, deontology perhaps presents a stronger appeal than that of utilitarianism or virtue ethics, in this case. That being said, there are only small, possibly negligible differences between these correlations and a general agreement in the need to address climate change overcomes any major preference of one ethical framework over another.

The "perceived seriousness of climate change" variable is positively correlated to all three ethical statements. For a one unit increase in the "perceived seriousness of climate change" variable, there is a 0.725 point increase in agreement with the *harm* statement ($p \leq 0.001$), 0.565 point increase in agreement with the *duty* statement ($p \leq 0.001$), and a 0.631 point increase in agreement with the *character* statement ($p \leq 0.001$). *Harm* has the strongest directionally positive effect, followed by *character,* then *duty.* I expected this variable to be correlated to all three ethical statements, as those who think climate change is a serious problem should be inclined to agree with any ethically-framed statement claiming the need to address climate change. This is based on the reasoning that a more serious problem has more of a need to be addressed.

Along similar lines, those who think that climate change is human-caused are more likely to agree with the *harm, duty,* and *character* statements than those who think climate change is mostly naturally caused, or not happening at all. While all of these correlations are directionally positive, the *harm* statement shows the strongest effect (between a 0.430 and 0.587 scale point increase depending on which dummy variable is being compared) and is also the most statistically significant, at the ($p \leq 0.001$) level. Respondents who think climate change is naturally caused are more likely to agree with the *harm* statement than those who think climate change is not happening. More interestingly though, is that those who think climate change is

not happening are more likely to agree with the *character* statement ($p \leq 0.05$) than those who think climate change is naturally caused. It is unclear why someone who indicates there is, "no solid evidence that the earth is warming" would also be more likely to agree that, "reducing the effects of climate change reflects our character and who we strive to be" than someone who thinks climate change is mostly naturally caused. This finding was not expected nor easily explained. It is possible that the *character* statement was understood as a negative instead of a positive. That is, a respondent might have thought that reducing the effects of climate change reflects our bad character (in that the act damages our character rather than improving it). Despite this possibility, it unlikely that the *character* statement was interpreted in this way; rather, more research should be conducted to further explain this finding.

Men are more likely than women to agree with the *character* statement (0.110 scale point increase in agreement at the ($p \leq 0.05$) level). It is unclear why this is the case, as pre-theoretical intuitions might lead one to think the opposite—that women are more likely than men to find the connection between being a person of exemplary character and addressing climate change more agreeable. Research also shows that women typically have greater concern about climate change (McCright, 2010; Xiao & McCright, 2012). This also leads me to believe that women would be more likely than men to agree with ethical justification to address climate change.

Those who identify as white are more likely to agree with the *harm* statement than those who identify as black, Asian, or some other race (0.171 point increase at the ($p \leq 0.01$) level). This counter to what some previous research shows, as blacks are more likely than whites to think climate change is human-caused (Pew Research Center, 2015b) and non-whites are more

supportive of policy to reduce carbon emissions than whites are (A. Leiserowitz & Akerlof, 2010).

For an increase of one year in age, there is a 0.004 scale point decrease in agreement with the *character* statement ($p \leq 0.05$). Therefore, the younger someone is, the more likely they are to agree with the *character* statement. While there are no current studies to explain why this is the case, pre-theoretical intuitions lead me to believe this is a reasonable finding. Younger individuals tend to have a stronger social media presence, and because of this may have an augmented appreciation and concern over maintaining their image (in effect, portraying good character) to a large and often vocal online community (Smith & Anderson, 2018). This finding supports that possibility that virtue ethics could be an effective tool for climate ethics framing among the younger demographic. Further research is needed to corroborate this speculation.

4. Limitations and Future Research

I assume that the three dependent variables measuring deontology, utilitarianism, and virtue ethics capture the actual meanings of these frameworks. By offering respondents statements about (1) the duty to protect human rights, (2) the minimization of human harm, and (3) the building and bettering of one's character, I intended to capture the main ideas of each ethical framework, but I did not directly measure how respondents interpreted these statements; this could have been accomplished through respondent interviews. Given how underdeveloped theory is in this specialized field of study, there are inherent limitations in the ability to validate these measures.

Each ethically framed message was also measured using a single item. While I was financially limited to a single item, I am confident that each ethical orientation was sufficiently assessed. I base this confidence on my results which support previous research and on the cross-

collaborative process of survey design, in which several professionals across disciplinary fields weighed in on item measures. The results of my statistical analysis correlate as I would expect them to if the *duty* statement measures the extent to which people agree with a deontological framework; that is, the more important religion is, the more likely one is to agree with this deontological statement—my variables measured what I theoretically expected them to. I expected to see this correlation based on a substantial previous research; since the correlation is present, it gives strong reason to believe that this single item measure did truly measure the concept of deontology. There is no superior theoretical reasoning to believe that alternative concepts better capture the meaning of my dependent variables other than deontology, utilitarianism, and virtue ethics. I would be more skeptical of the *duty* statement truly measuring deontological concepts if the correlation was not present.

I believe that virtue ethics is also correctly captured, as younger individuals are more likely to agree with the *character* framework over other frameworks. Pre-theoretical intuitions point to this being a reasonable finding. One could stereotypically imagine younger individuals caring about their image and how they present themselves to the world more than older adults, especially based on younger individuals' over-represented presence on social media platforms (Smith & Anderson, 2018).

It is also likely that the utilitarian statement is adequately captured because while it appeals to harm avoidance and possibly risk aversion (both easily linked back to utilitarianism), the *harm* statement was overall most agreeable to respondents. This coheres with expectations because utilitarianism offers traditionally strong (and sometimes arguably superior) reasoning to commit a moral act. Despite the likelihood that dependent variables were adequate measures, a qualitative approach such as respondent interviews on dependent variable interpretation

would give more confidence to the validity of these measures. Future research should also include a multi-item assessment of each ethical framework to improve measurement reliability.

As found in *Appendix 4. Pearson Correlations of Dependent Variables*, the Pearson correlations of the dependent variables are relatively high, between 0.681-0.719. While this appears to be a limitation of the study it should not be considered as such. Some of these correlations are higher than 0.7 meaning that some respondents interpreted these statements similarly or nearly the same—this is expected. Respondents who think climate change is human-caused as well as a serious problem are likely to find any ethical justification to address climate change agreeable. In this study, I attempt to uncover the small differences in ethical interpretation among specific demographic groups that do *not* wholeheartedly agree with climate change sentiments. I do this to show that appropriately framed ethical appeals can nudge groups in the desired direction. Sometimes appealing to a general or poorly matched ethical appeal—such as virtue ethics or utilitarian appeal in the case of religious Americans—is not sufficient to elicit such a response. A correctly chosen ethical appeal such as deontology for religious Americans has a greater chance of prompting this nudge. As climate change can be a multi-faceted issue in the first place, it makes sense that framing a concept in familiar terms one already lives by would increase agreeability. Therefore, and to reiterate, high correlations are expected and not necessarily determinantal. To dismiss these results because of high correlations would be a disservice to this research.

Another limitation of this study is the measurement of the religiosity variable. Only one measure of religiosity was collected, and only one aspect of religiosity was investigated. While I measured perceived religious importance, other common religiosity measures include prayer frequency, church attendance, Biblical literalism, and religious fundamentalism. Some of these

measures may have proven explanatory to this research, but because of financial limitations I was unable to include further measures. Some of these measures also focus on Christianity, whereas I sought to measure religiosity across religions with my measure. Further, other peer-reviewed research articles use one measure of religiosity, some of which even using the same or nearly the same wording as the religiosity measure of this study (Bobowik et al., 2010; Rice & McAuliffe, 2009).

In my survey, the wording of the religiosity measure more closely aligns with the intrinsic rather than extrinsic interpretation of religiosity,[27] as other studies have used the same or nearly the same wording as the measure of this study to measure intrinsic religiosity (Kurpis et al., 2008; La Barbera & Gürhan, 1997). It is likely that I captured religion's intrinsic importance because the correlation of religiosity to agreement with a deontological frame loses its theoretical power if only extrinsic importance was captured. If at the very least both types of importance were captured, results would show a watered-down effect of a deontological frame, as intrinsic religiosity (a measure of religion's true inherent value to the religious practitioner) should have a stronger correlation to deontological agreeability than extrinsic religiosity (a measure of religion's instrumental value to the religious practitioner).

This research is also limited by its design. Surveys were taken at a specific point in time, and they must be understood within the constraints of these parameters, including possible susceptibility to mood effects. Future research should include measurement of respondents' willingness to take mitigation steps on behalf of climate change, such as driving less, eating

[27] The differentiation between intrinsic and extrinsic religious importance (explained by the religious orientation scale) sometimes proves relevant in the literature (G.W. Allport, 1950; Gordon W. Allport & Ross, 1967; Burks & Sellani, 2008; Hassanian & Shayan, 2017; Henningsgaard & Arnau, 2008; J. Vitell, 2009; S. J. Vitell et al., 2005). The extrinsic importance of religiosity stresses its instrumental value, meaning that religion is perceived as important because it is a means to other desirable ends not fundamental to religion itself. The intrinsic importance of religiosity stresses the inherent value religion brings to the religious practitioner's life.

less meat, planting trees, buying carbon credits, or reducing their carbon footprint in some other way. Measuring these behavioral items would show that message framing can further measure people's willingness to change behavior, and therefore would provide greater support of the effectiveness of this message framing technique; it would also allow for a more in-depth understanding of the attitude-behavior relationship.

5. Conclusion

The objective of this research was to determine if the way in which ethically focused mitigation messaging is framed influences message acceptance among particular demographic groups. To do this, I employed three ethical frameworks—deontology, utilitarianism, and virtue ethics—as frames of the individual's ethical obligation to address climate change. More specifically, I wanted to determine if religiosity would be correlated to a deontological framing of these obligations. Those who identify as religious are representative of a group that is exposed to deontological appeals more frequently than other groups. This is in no small part due to the emphasis of deontological appeals in religious texts and teachings. Because the religious community is already familiar with deontological phrasing and has been measurably shown to assess ethical situations in deontological ways, I hypothesized that religiosity would be positively correlated with agreement to a deontologically framed mitigation message (Barak-Corren & Bazerman, 2017; Conway & Gawronski, 2013; Goodwin & Darley, 2008; J. Graham & Haidt, 2010; Piazza, 2012; Piazza & Landy, 2013; Piazza & Sousa, 2014; Szekely et al., 2015; Tetlock, 2003). Statistical analysis supports this hypothesis at the ($p \leq 0.01$) level.

Future research should explore what specific features of religiosity affect this correlation and if more specific message phrasing amplifies this effect. For example, it is unclear whether a *religiously* framed deontological message would be more strongly correlated

with religiosity than the *secular* deontological claim offered in this study by the *duty* statement. My survey offers the statement, "We have a duty to protect the rights of people who will be affected by climate change," but this statement employs a general and secular appeal to duty and human rights. An example of a more religiously based deontological statement might be: "We have a duty as religious followers and stewards of the Earth to protect the rights of people who will be affected by climate change." While it is suspected that a statement such as this would more strongly correlate to religiosity than the *duty* statement offered in this study, further research is needed to confirm this supposition. Regardless, it is clear and encouraging that the correlation between religiosity and a deontological statement persists even in secular form, showing that the deontological appeal can be separated from a religious context and maintain its effectiveness as an ethical appeal among religious Americans. Overall, these results are relevant to ongoing research into message framing for religious Americans. Re-framing climate action messages using a deontological frame therefore holds promise for capturing a greater audience of those who identify as religious within the United States.

There is utility in understanding which ethical framework is used in decision-making among Americans, especially as this decision-making relates to ethical justifications to address climate change. The results of this study give further confidence that skeptical groups are not unwavering in their rejection or apathy of climate messages; rather, they lack exposure to relatable messages that appeal to their common values and ideals. Here, I determined which ethical approach is relatable to religious Americans, adding to existing literature on message framing and offering a new resource for the progression of climate advocacy.

Disclosure Statement

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Tables and Figures

TABLE 1.1 shows relevant survey questions and answer options to each question.

Statements used as Dependent Variables	***Response Options***
1. (*Character*) Reducing the effects of climate change reflects our character and who we strive to be	strongly disagree; disagree; neither agree nor disagree; agree; strongly agree
2. (*Harm*) Harm will come to people if we do not reduce the effects of climate change	strongly disagree; disagree; neither agree nor disagree; agree; strongly agree
3. (*Duty*) We have a duty to protect the rights of people who will be affected by climate change	strongly disagree; disagree; neither agree nor disagree; agree; strongly agree
Questions used as Independent Variables*	***Response Options***
4. How important is religion in your life?	not at all important; not too important; somewhat important; very important

The following demographic information was also used as controlled independent variables: age, education level, annual income, gender, race, Hispanic heritage, religion type, Evangelical identification, political ideology, perceived seriousness of climate change as a problem, and cause/existence of recent temperature increases.

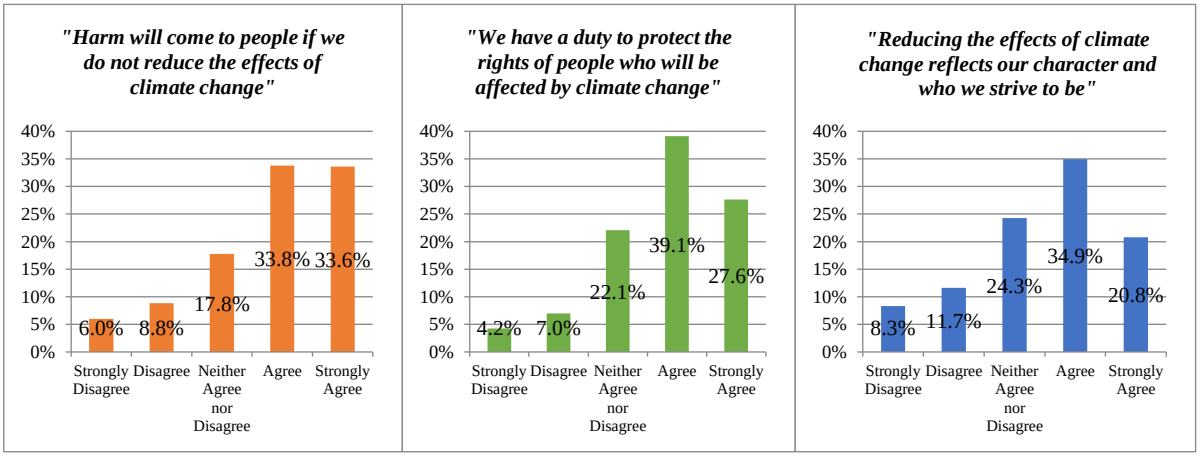

FIGURE 1.1. Bar graphs (n=1202) show respondents' level of agreement with the utilitarian, deontological, and virtue ethical framework statements relating to the reduction of carbon emissions, respectively. Most respondents "agree" or "strongly agree" with each statement.

TABLE 1.2 shows results from a two-tailed multiple regression analysis (n=1202) to respondents' level of agreement with the following statements: *harm*: "Harm will come to people if we do not reduce the effects of climate change," *duty*: "We have a duty to protect the rights of people who will be affected by climate change," and c*haracter*: "Reducing the effects of climate change reflects our character and who we strive to be." Results that are bolded are significant at the ($p \leq 0.05$) level or better.

	Harm Statement			
	B (st. error)	p-value	Confidence interval (95%)	
			Lower bound	Upper bound
Constant	0.458 (0.233)	0.050	0.108	1.008
Gender	0.022 (0.042)	0.595	-0.060	0.104
Age	0.001 (0.002)	0.932	-0.003	0.003
Political Ideology	**0.078 (0.016)**	**0.001**	**0.047**	**0.110**
Annual Income	-0.004 (0.007)	0.593	-0.017	0.010
Education Level	0.022 (0.013)	0.104	-0.005	0.048
White dummy	**0.171 (0.058)**	**0.003**	0.057	0.285
Hispanic Heritage	0.005 (0.076)	0.948	-0.145	0.155
Religiosity	0.027 (0.027)	0.313	**-0.026**	**0.081**
Non-religious dummy	0.007 (0.083)	0.929	-0.155	0.170
Christian Non-Evangelical dummy	-0.057 (0.057)	0.310	-0.168	0.054
Religious non-Christian dummy	**0.175 (0.088)**	**0.047**	0.002	0.349
Perceived Seriousness of CC	**0.725 (0.033)**	**0.001**	**0.659**	**0.791**
Temp increases mostly human-caused dummy	**0.587 (0.084)**	**0.001**	**0.422**	**0.753**
Temp increases mostly natural dummy	**0.157 (0.073)**	**0.031**	0.014	0.300
R^2	0.657 (0.690)	--	--	--
N	1202			
Temp increases mostly human-caused dummy	**0.430 (0.061)**	**0.001**	**0.311**	**0.549**
No solid evidence the earth is warming dummy	**-0.157 (0.073)**	**0.031**	-0.300	-0.014
Non-religious dummy	0.065 (0.065)	0.321	-0.063	0.193
Evangelical Christian dummy	0.057 (0.057)	0.310	-0.054	0.168
Religious non-Christian dummy	**0.233 (0.078)**	**0.003**	0.079	0.387

	Duty Statement			
	B (st. error)	p-value	Confidence interval (95%)	
			Lower bound	Upper bound
Constant	1.055 (0.255)	0.001	0.555	1.554
Gender	0.016 (0.046)	0.721	-0.073	0.106
Age	0.001 (0.002)	0.673	-0.003	0.004
Political Ideology	**0.119 (0.017)**	**0.001**	**0.085**	**0.153**
Annual Income	-0.001 (0.007)	0.943	-0.015	0.014
Education Level	0.015 (0.015)	0.318	-0.014	0.044
White dummy	-0.005 (0.064)	0.934	-0.130	0.119
Hispanic Heritage	0.030 (0.083)	0.724	-0.134	0.193
Religiosity	**0.078 (0.030)**	**0.009**	**0.020**	**0.136**
Non-religious dummy	-0.026 (0.091)	0.776	-0.203	0.152
Christian Non-Evangelical dummy	-0.080 (0.062)	0.196	-0.201	0.041
Religious non-Christian dummy	-0.004 (0.096)	0.964	-0.193	0.185
Perceived Seriousness of CC	**0.565 (0.037)**	**0.001**	**0.493**	**0.637**
Temp increases mostly human-caused dummy	**0.225 (0.092)**	**0.015**	**0.044**	**0.407**
Temp increases mostly natural dummy	-0.069 (0.080)	0.385	-0.226	0.087
R^2	0.497 (0.754)	--	--	--
N	1202			
Temp increases mostly human-caused dummy	**0.295 (0.066)**	**0.001**	**0.165**	**0.425**
No solid evidence the earth is warming dummy	0.069 (0.080)	0.385	-0.087	0.226
Non-religious dummy	0.054 (0.071)	0.446	-0.085	0.194
Evangelical Christian dummy	0.080 (0.062)	0.196	-0.041	0.201
Religious non-Christian dummy	0.076 (0.085)	0.375	-0.092	0.243

	Character Statement			
	B (st. error)	p-value	Confidence interval (95%)	
			Lower bound	Upper bound
Constant	1.287 (0.292)	0.001	0.714	1.861
Gender	**-0.110 (0.052)**	**0.036**	**-0.213**	**-0.007**
Age	**-0.004 (0.002)**	**0.026**	**-0.008**	**-0.001**
Political Ideology	**0.099 (0.020)**	**0.001**	**0.060**	**0.138**
Annual Income	-0.012 (0.008)	0.154	-0.028	0.004
Education Level	0.020 (0.017)	0.237	-0.013	0.053
White dummy	0.122 (0.073)	0.095	-0.021	0.264
Hispanic Heritage	-0.086 (0.096)	0.374	-0.274	0.103
Religiosity	0.050 (0.034)	0.141	-0.017	0.117
Non-religious dummy	-0.018 (0.104)	0.859	-0.222	0.185
Christian Non-Evangelical dummy	-0.058 (0.071)	0.416	-0.196	0.081
Religious non-Christian dummy	0.064 (0.110)	0.561	-0.152	0.281
Perceived Seriousness of CC	**0.631 (0.042)**	**0.001**	**0.549**	**0.713**
Temp increases mostly human-caused dummy	**0.213 (0.106)**	**0.044**	**0.005**	**0.420**
Temp increases mostly natural dummy	**-0.189 (0.091)**	**0.039**	**-0.368**	**-0.010**
R^2	0.477 (0.864)	--	--	--
N	1202			
Temp increases mostly human-caused dummy	**0.401 (0.076)**	**0.001**	**0.252**	**0.551**
No solid evidence the earth is warming dummy	**0.189 (0.091)**	**0.039**	**0.010**	**0.368**
Non-religious dummy	0.039 (0.082)	0.632	-0.121	0.199
Evangelical Christian dummy	0.058 (0.071)	0.416	-0.081	0.196
Religious non-Christian dummy	0.122 (0.098)	0.214	-0.070	0.314

TABLE 1.3 Independent variables from Table 1.2 are compared to the "perceived seriousness of climate change" and "climate change is mostly human-caused" variable as dependent variables. This is done to show that while religiosity is correlated to perceived seriousness of climate change as a problem, it is not correlated to a belief that climate change is human-caused. Results that are bolded are significant at the ($p \leq 0.05$) level or better.

	Perceived seriousness of climate change			
	B (st. error)	p-value	Confidence Interval (95%)	
			Lower bound	Upper bound
Constant	2.085 (0.195)	0.001	1.209	1.988
Gender	**0.164 (0.036)**	**0.001**	**0.092**	**0.235**
Age	-0.001 (0.001)	0.557	-0.003	0.002
Political Ideology	**0.142 (0.013)**	**0.001**	**0.116**	**0.169**
Annual Income	-0.003 (0.006)	0.626	-0.014	0.009
Education Level	-0.009 (0.012)	0.426	-0.033	0.014
White dummy	**-0.134 (0.051)**	**0.008**	**-0.234**	**-0.034**
Hispanic Heritage	**-0.153 (0.067)**	**0.022**	**-0.284**	**-0.022**
Religiosity	**0.053 (0.024)**	**0.025**	**0.007**	**0.100**
Non-religious dummy	**0.228 (0.072)**	**0.002**	**0.086**	**0.370**
Christian Non-Evangelical dummy	**0.105 (0.049)**	**0.033**	**0.008**	**0.202**
Religious non-Christian dummy	0.102 (0.077)	0.184	-0.049	0.254
Temp increases mostly human-caused dummy	**1.416 (0.061)**	**0.001**	**1.296**	**1.536**
Temp increases mostly natural dummy	**0.486 (0.062)**	**0.001**	**0.364**	**0.608**
R^2	0.595 (0.604)	--	--	--
N	1202			
Temp increases mostly human-caused dummy	**0.930 (0.046)**	**0.001**	**0.841**	**1.020**
No solid evidence the earth is warming dummy	-0.486 (0.062)	0.001	-0.608	-0.364

	Climate change is mostly human-caused			
	B (st. error)	p-value	Confidence Interval (95%)	
			Lower bound	Upper bound
Constant	0.330 (0.135)	0.015	0.065	0.596
Gender	0.031 (0.025)	0.226	-0.019	0.080
Age	**-0.003 (0.001)**	**0.001**	**-0.005**	**-0.001**
Political Ideology	**0.128 (0.009)**	**0.001**	**0.111**	**0.145**
Annual Income	-0.001 (0.004)	0.783	-0.009	0.007
Education Level	**0.019 (0.008)**	**0.024**	**0.002**	**0.035**
White dummy	-0.068 (0.035)	0.056	-0.137	0.002
Hispanic Heritage	-0.089 (0.046)	0.057	-0.180	0.003
Religiosity	-0.002 (0.017)	0.894	-0.035	0.030
Non-religious dummy	0.038 (0.050)	0.449	-0.061	0.137
Christian Non-Evangelical dummy	-0.004 (0.034)	0.917	-0.071	0.064
Religious non-Christian dummy	-0.023 (0.054)	0.669	-0.128	0.083
R^2	0.258 (0.421)	--	--	--
N	1202			

Chapter 2: Persuasive Ethical Appeals of Climate Change Message Framing: A Survey of Americans' Ethical Preferences

Abstract

Incorporating pre-existing values into target messages increases their persuasiveness. I employ this concept to frame climate change messages using deontology, utilitarianism, and virtue ethics: three normative ethical frameworks one can use to assess an ethical obligation. In this study I determine which of these frameworks most persuasively frame the individual's ethical obligation to reduce the effects of climate change. Because of the religious' preference to assess ethical situations in deontological ways, a deontologically framed climate change message should be the most persuasive message type to the religious demographic. A representative sample of 1,202 respondents is polled. Results show that religious respondents are more likely to find a deontological appeal more persuasive than a utilitarian appeal ($p \leq 0.05$), but there is no correlation to the virtue ethics appeal. This and other findings are discussed, and implications provided.

KEYWORDS: climate change beliefs, ethical frameworks, values, message framing, survey

1. Introduction

In this paper, I analyze a survey (n=1,202) that is nationally representative across the United States. I ask respondents to rank the persuasiveness of statements about their ethical obligation to reduce the effects of climate change. These statements are framed using the three normative ethical frameworks of deontology, utilitarianism, and virtue ethics. The results from this analysis show which type of ethically framed message is most persuasive among various demographic groups. I specifically focus on the religious demographic and its preference for a deontological framework.

1.1 Pre-Existing Values as a Message Framing Tool

Effectively communicating environmental messages is key to increase environmental support (Dixon et al., 2017; Nisbet, 2009). This is especially true of climate change, where the American public's acceptance of it does not match scientific consensus[28] (Cook et al., 2013; Anthony Leiserowitz et al., 2018). One way to increase this acceptance among the American public is by incorporating skeptical audiences' pre-existing beliefs and values into targeted pro-environmental messaging. By doing this, we can increase the likelihood that messages will be persuasive and acceptable to target audiences. Messages are seen as less of a threat when the discrepancy between the message receiver's pre-existing beliefs and message content is minimized (Gamson & Modigliani, 1987; Sherif & Hovland, 1961; Sherif, Taub, & Hovland, 1958; Snow et al., 1986).

The success of using pre-existing values as message frames relies upon accurately determining what the most relevant values among target groups are. A notable example is Haidt's (2010) elaboration of Moral Foundations Theory (MFT), which explains that values relevant to moral judgement depend upon an individual's political leanings (Jesse Graham, Haidt, & Nosek, 2009; Haidt, 2007). Whereas conservatives value the ideals of in-group loyalty, sanctity/purity, respect for authority, harm/care, and fairness/reciprocity about equally, liberals value the latter two much more than the former three and rely mostly on the latter two when making moral judgements. The attitudes of each group therefore, vary depending on which values are appealed to. For example, if a target group consists largely of liberals, it would be inappropriate to appeal to the preservation of purity because it is not an ideal that liberals

[28] While over 97% of climate scientists say anthropogenic climate change is happening, only 62% of the American public thinks so.

commonly appeal to in moral judgement. The message would not be relatable and thus not persuasive for this group.

Perceiving environmental issues in moral terms can alter the valence and strength of environmental attitudes (Stern, et al., 1999), but only when salient values are used as appeals. For example, Wolsko, Ariceage and Seiden (2016) found that pro-environmental messages are typically framed with MFT values that are preferred by liberals, in part explaining why conservatives lag behind liberals in their environmental support. If instead the appropriate conservative values are used in pro-environmental messaging, there is no significant difference between conservative and liberal support. To explain, conservatives move "substantially in the pro-environmental direction after exposure to a binding moral frame, in which protecting the natural environment was portrayed as a matter of obeying authority, defending the purity of nature, and demonstrating one's patriotism to the United States" (Wolsko, Ariceaga, & Seiden, 2016). Shifts are even more pronounced when conservatives think the message originated from their in-group. Employing the appropriate frames in these pro-environmental messages eliminated the gap between conservative and liberal attitudes and in effect created a more unified perspective on a traditionally "liberal" issue (Feinberg & Willer, 2013; Wolsko et al., 2016).

MFT exemplifies how framing targeted messages with relevant values increases the likelihood that these messages will be agreeable to otherwise skeptical groups. I similarly determine what values are salient among the American religious community, another group that is divided on its environmental views (particularly climate change) so that I can incorporate these values in climate change messaging. Messages framed with values that are integrated into

religious moral thinking should increase the likelihood of message acceptance among this group.

Rather than focus on the values espoused by MFT, I instead choose to measure how the three normative ethical frameworks of utilitarianism, deontology, and virtue ethics affect the moral judgements of the religious. MFT values are useful for framed messages for groups of varying political ideologies but would not be the most appropriate choice for targeted messages for the religious. Previous studies have shown that there is a strong relationship between religiosity and deontological thinking style and that political conservativism, a general concern for authority, sanctity, in-group loyalty, or other psychological factors separate from religious belief cannot explain this relationship (J. Graham & Haidt, 2010; Laurin et al., 2012; Piazza, 2012; Piazza & Landy, 2013; Piazza & Sousa, 2014; Shenhav et al., 2012). This offers strong rationale that MFT values would not be the most fitting option to frame messages of this capacity for the religious. Rather, deontology—one of the three normative ethical frameworks—is a more suitable and promising option.

1.2 Religiosity and Skeptical Climate Change Attitudes

Research on the connection between religiosity and environmental attitudes is mixed. While some studies show no correlation between church attendance, prayer frequency, and environmental concern (Konisky, Milyo, & Richardson, 2008), others show that religiosity is correlated to greater environmental concern (Eckberg & Blocker, 1989; Kanagy & Nelsen, 1995; Kanagy & Willits, 1993). Yet others show that religiosity depresses interest in environmental protection among mainline Protestants, Evangelical Protestants, and Catholics (Arbuckle & Konisky, 2015). Similarly mixed results are found among various religious groups and their views on climate change, as shown by numerous public opinion polls such as those

administered by the Yale Project on Climate Change Communication, a research center conducting surveys on climate change knowledge, opinions, attitudes, and behavior.

According to the Yale Project on Climate Change Communication's "Global Warming's 6 Americas," Americans fall into one of six groups, classified by their ideas on climate change. The spectrum ranges from 'alarmed'—encompassing those with the highest belief in global warming[29] and who are the most concerned and motivated about it—to 'dismissive'—comprising of those with the lowest belief in global warming and the least concern and motivation about it. Individuals with strongly religious beliefs are overrepresented in groups that are less motivated, less concerned, and maintain lower beliefs in global warming (Yale Project on Climate Change & George Mason University Center for Climate Change Communication, 2009). The 'dismissive' group also reports the highest levels of religiosity, with 68% reporting to be very or moderately religious; other groups are less, but comparably religious. Kilburn (2014) found that the probability of believing in anthropogenic climate change decreases from 0.47 to 0.17 when comparing low religiosity to high religiosity. While studies on religiosity's effect on climate change attitudes present inconsistent findings, religiosity is not an overwhelmingly positive indicator of pro-climate change beliefs. Because of this, religiosity is an appropriate demographic on which to focus climate change communication research. Determining which message frames persuasively communicate the individual's obligation to address climate change could result in new techniques to involve those who are otherwise disengaged with the issue. This has obvious policy and environmental advocacy implications.

[29] I use the term 'global warming' to reflect the terminology used in the study.

1.3 Religiosity and the Moral Appeal

Religion influences how morals and values associated with individual and group identity are shaped (Emmons & Paloutzian, 2003). It also impacts how we interact with the world, how we view the environment, and how we determine what our roles are within it. Religion then, has a significant role in the formation and alteration of environmental beliefs and attitudes (Bloom, 2012; Jackson & Coursey, 1988; Sachdeva, 2016; Seul, 1999). Because morals are deeply integrated and impactful, helping to shape how people process information, framing messages with moral motivations should influence environmental engagement and support among the religious demographic (Feinberg & Willer, 2013; Markowitz & Shariff, 2012a).

This appeal should have particular resonance within the United States, as most Americans (54%) state that religion plays a "very important" role in their lives (Gao, 2015). Americans also tend to be more religious than individuals of other developed nations. Because many of these Americans could be categorized into the less concerned groups of "Global Warming's 6 Americas" and additionally have values that are consistent with a moral framing of climate change, morally framing mitigation messages could engage those who are otherwise apathetic towards climate change (Leiserowitz, et al., 2016). Morally framing the issue of climate change has already shown to be an effective way to include the religious community in the climate change conversation. For example, Pope Francis's encyclical on climate change, *Laudato Si': On Care for Our Common Home,* transformed the way Americans' (especially Catholics) viewed climate change when he called on the religious community's duty to protect and care for nature (Pope Francis, 2013). Because of the Pope's encyclical, Americans became more interested in and concerned about global warming and its impacts. This influence was so

noteworthy that is was named the "Francis Effect" (Anthony Leiserowitz et al., 2016; Maibach et al., 2015).

1.4 Religious Values for Message Framing

In what follows, I test which of three normative ethical frameworks—deontology, utilitarianism, or virtue ethics—most persuasively frame the individual's ethical obligation to address climate change. I base this research on the supposition that religious individuals will react more strongly in the positive direction to an ethical framework that most resembles their pre-existing ethical thought processes. Current literature shows a strong relationship between religiosity and a deontological thinking style. Due to these findings, I hypothesize that deontology will provide the most persuasive frame for the religious, and I compare this hypothesis with the alternative that they may prefer one, none, or both of the other two frameworks.[30]

Each ethical framework is used to justify the need to reduce the effects of climate change. Deontology's reasoning focuses on fulfilling one's duty to protect the rights of those who will be affected by climate change. Utilitarianism's reasoning focuses on increasing the welfare of those that will be harmed by the effects of climate change. Virtue ethics' reasoning focuses on mitigating emissions because individuals with good character would do so. In a nationally representative survey (n=1,202), I ask respondents to rank which statement represents the most persuasive reason to address climate change. I hypothesize that a message

[30] I employ specific ethical frameworks rather than a general ethical frame because the term 'ethics' is broad and too vague to be fully relatable to explicit demographic groups' existing value systems. While a general ethical appeal could be persuasive, a specific ethical appeal depicting the characteristic pre-existing values used in religious moral judgement would be more persuasive. Therefore, I determine if re-framing these messages with specific and appropriate ethical frames increases the salience and persuasiveness of these messages over messages appealing to other frameworks.

framed with a deontological appeal will be the most persuasive statement to the religious. I give further detail of these ethical frameworks in *Section 1.4.1 The Normative Ethical Frameworks.*

1.5 The Normative Ethical Frameworks

The three common normative ethical frameworks of deontology, utilitarianism, and virtue ethics use unique criteria to determine whether an action, situation, person, or result is ethically justified.

Deontology focuses on adherence to one's duty or moral obligations (Bunnin & Tsui-James, 2003; Honderich, 2005; Kant, 1785). Following rules derived from maxims[31] allows for actions that are right in themselves. In theory, no one can accurately predict future consequences, so they are accordingly de-emphasized. For example, perhaps a young woman helping an elderly man across the street does so because she thinks it is the younger generation's duty to help the elderly generation—a generation which has done so much for society. Because the woman is compelled by duty and obligation, she is motivated by deontological appeals to help the man rather than some other ethical framework.

Utilitarianism focuses on an action's consequences (Bentham, 1907; Mill, 1863). The best and most ethical action an individual can take is one that maximizes overall welfare in any given situation (Honderich, 2005; Perry, 2014). Actions are therefore justified by their results. Considering our example again, the young woman upon seeing an elderly man struggling to cross the street with a heavy bag of groceries, crosses the empty street herself and assists him. The young woman incurs no bad consequences by doing this, and the elderly man's welfare increases because he no longer has to strain himself by carrying groceries in a frail state. Perhaps she even prevents the man from falling and breaking a hip. Her decision to act is based on her

[31] Maxims are general truths, principles, or rules on how to conduct oneself.

goal of minimizing harmful consequences. This is an example of a right act because good consequences were maximized, and the greatest good for the greatest number of people (in this case two people) is realized.

Virtue ethics does not adhere to consequences or to one's duty, but rather to the moral agent's ability to cultivate exemplary character or virtues. Virtue ethics answers questions of how we should live and why it is we should live that way. With practice, the moral agent knows how, when, and why to employ appropriate virtues. Committing right actions for the right reasons arises from the outflow of rightly cultivated virtues (Hursthouse, 1999; Hursthouse & Pettigrove, 2016b; Perry, 2014). Virtue ethics emphasizes agency; an individual could commit a right act for a wrong reason under a virtue ethics framework for example, but not under a utilitarian or deontological framework. Take for instance again the young woman in our example: if she was influenced by virtue ethics she would not help the elderly man because she *knows* the act to be a compassionate one, but rather because she feels genuine concern and sympathy for the man. Her main motivation is not to duty or to the maximization of consequences or even to be *seen* as a compassionate person, but rather it is to a manifestation of good virtues that she has rightly cultivated. The compassion the young woman cultivated motivates her to go out of her way to help those in need.

As shown with the example of the young woman and the elderly man, employing any one of these frameworks could lead to the same ultimate action. That being said, some might feel a stronger pull to one framework over others. This study determines whether people find one ethical appeal more persuasive than others as they pertain to the individual's ethical obligation to reduce the effects of climate change. Next, I show that religious individuals are predisposed to think in deontological ways.

1.6 Religiosity and Ethical Decision-Making Pathways

Religiosity measures how important religion is to the individual's life.[32] Some definitions include belief in God, following doctrine one believes to have been set by God (McDaniel & Burnett, 1990), or the "personal practice of religion" (Gordon W. Allport & Ross, 1967). It is supposed that the more intrinsically religious someone is, the more likely they are to take the guidance and lessons of their faiths seriously; this includes the ethical appeals and frameworks that are commonly emphasized in religious texts. These influences are not prevalent among the non-religious community, thus allowing for divergent ethical decision-making pathways between the two groups (Goodwin & Darley, 2008; J. Graham & Haidt, 2010; Piazza, 2012; Piazza & Sousa, 2014; Tetlock, 2003). In what follows, I further explain this occurrence and explain its relevance to message framing.

1.7 Religiosity and the Deontological Worldview

Because religious texts emphasize ethical living as well as shape the ethical decision-making processes of its followers, determining the ethical structures of religious texts could give insight into how religious individuals process ethical issues (Shelby D. Hunt & Vitell, 2006; Singh, 2001). For example, religiously motivated people strongly believe in the moral authority of God and perhaps as a result of this, de-emphasize the importance of human reason and intuition in favor of following God's word (Piazza & Landy, 2013). Divesting away from utilitarian reasoning in favor of deontology is supported by an augmented pessimism about the

[32] The question used to measure religiosity more closely aligns with the intrinsic dimension of religiosity rather than the extrinsic dimension of religiosity (G.W. Allport, 1950; Gordon W. Allport & Ross, 1967; J. Vitell, 2009). The intrinsic dimension encompasses, "motivations based upon the inherent goals of religious tradition itself," (J. Vitell, 2009) and a genuinely incorporating faith and religious beliefs into one's life (Shelby D. Hunt & Vitell, 2006). The extrinsic dimension is a "source of comfort, social support, self-justification, and/or status" (Shelby D. Hunt & Vitell, 2006), and relates to "utilitarian motivations that might underlie religious behaviors" (J. Vitell, 2009). Basically, being religious is a means to an end, not an end in itself.

human condition and a fear of making a wrong decision based on flawed human reasoning. Banerjee, Huebner, and Hauser (2010) find that the more religious someone is, the less likely they are to be utilitarian. Following directives set by God is wiser and preferable to the alternative of independently (and perhaps incorrectly) deciding what actions will optimize favorable outcomes.

Religious people are more likely to evaluate whether their actions are in accordance with norms rather than whether their actions are optimizing outcomes (Banerjee et al., 2010; Barak-Corren & Bazerman, 2017; Conway & Gawronski, 2013; Piazza, 2012; Piazza & Landy, 2013; Piazza & Sousa, 2014; Szekely et al., 2015; Tetlock, 2003). Norms—standard or typical actions people are expected to take—are espoused and highly revered in religious texts. For example, 'thou shall not kill', 'thou shall not steal', 'do unto your neighbors as you would have them do unto you,' or 'to end suffering, you must follow the Eightfold Path,' are directives[33] that a religious individual might live by. If the religious community understands these directives to be important to follow, these directives might persist as norms within the community. Norms mirror a deontological framework because they are reflective of principles that should be followed because they are good in themselves; this deontological reasoning ultimately influences the individual's ethical thought processes. By placing such importance on a specific way of thinking, one might suppose that, "a priori, compared with nonreligious people…(1) highly religious people would have more clearly defined deontological norms and that (2) such norms would play a stronger role in ethical judgements" (Shelby D. Hunt & Vitell, 2006). Conversely, non-religious individuals lack this particular normative influence in their lives and so have not repressed their preference for utilitarian reasoning.

[33] These directives might come in the form of commandments, precepts, orders, laws, duties, or truths, for example.

Deontology is suspected to play such an integral role in the religious practitioner's life that it cannot be separated from the decision-making process when analyzing an ethical claim. The idea of following norms, acting on one's duty, obeying commandments, or following truths, are reflective of a deontological ethic. The religious being more familiar with the deontological approach and finding the moral teachings of religious texts important, will find a deontological claim more persuasive than a claim founded in other ethical frameworks. I expect deontology to play such an influential role in the religious practitioner's life that even secular deontological claims will be more persuasive than claims based in other frameworks. Framing the obligation to reduce the effects of climate change as one's duty (a deontological supplication) should be more persuasive to the religious demographic than a similarly framed utilitarian message. My hypothesis is:

> **Hypothesis**: The more religious respondents are, the more likely they are to find a deontologically framed message more persuasive than a utilitarian framed message when it comes to their ethical obligation to reduce the effects of climate change.

There is insufficient evidence claim that there will be a statistically significant preference for deontology over virtue ethics. A study by Van Pachterbeke, Freyer, and Saroglou (2011) shows that religious people are more likely to follow abstract ideas of deontology over an interpersonal type ethic more reflective of virtue ethics, but this is not enough evidence to confidently predict the same for this study (Van Pachterbeke, Freyer, & Saroglou, 2011). So overall, we have strong evidence of the religious community's preference for deontology over utilitarianism and weak initial evidence that this community also prefers deontology over virtue ethics. Virtue ethics remains one of the three normative ethical frameworks alongside deontology and utilitarianism and is included in the survey to assure test the assumption that it will not be statistically significant. This study aims to determine the effects of normative ethical

frameworks on message framing persuasiveness in comparison to each other, so virtue ethics is not only called for here, but needed.

2. Data Measurement and Operationalization

The survey for this study was administered in February of 2018 through Survey Sampling International,[34] with responses (n=1,202) representative across the United States.[35] In the survey, I ask respondents to rank which ethically framed message is the most persuasive reason to reduce the effects of climate change. I analyze the data using multinomial logistic regression[36] in Statistical Package for Social Scientists (SPSS).

2.1 Dependent Variables

I ask respondents to rank three statements, shown in Table 2.1, by persuasiveness. The question offers, "Below are three reasons someone might give for reducing the effects of climate change. Which reason do you find most persuasive? Rank the order. (1=most persuasive, 3=least persuasive)." The statements are framed with a deontological, utilitarian, or virtue ethical appeal. I have respondents rank each statement by persuasiveness to determine if one ethical framework more persuasively frames the need to reduce the effects of climate change than others. By doing this, I further describe how message framing can be used to increase mitigation advocacy among various, potentially skeptical, demographic groups. The statements are: (a) "We have a duty to protect the rights of people who will be affected by climate change," which represents an appeal to deontology because it appeals to the moral

[34] Exempt under Institutional Review Board Protocol 17-075.
[35] See *Appendix 5. Nationally Representative Survey Data* for a comparison of survey demographics versus U.S. population census data.
[36] Multinomial logistic regression is used when the dependent variable is nominal and has more than two categories. In the case of the dependent variable of this study, there are three categories. The categories are (1) choosing the *duty* statement as most persuasive, (2) choosing the *harm* statement as most persuasive and (3) choosing the *character* statement as most persuasive.

agent's duty to preserve justice and protect individual rights (as a rule or universal law); (b) "Harm will come to people if we do not reduce the effects of climate change," which is representative of an appeal to utilitarianism because it shows that harm (or negative consequences) caused by climate change can be minimized if mitigation occurs; and (c) "Reducing the effects of climate change reflects our character and who we strive to be," which is representative of an appeal to virtue ethics because it directly appeals to the agent's character. These options were randomized upon implementation.

2.2 Independent Variables

Religiosity is the predictor variable of interest.[37] To measure religiosity I ask respondents, "How important is religion in your life?" Answer options are: (1) not at all important, (2) not too important, (3) somewhat important, and (4) very important. This is a common measure of religiosity, with many studies using the same or nearly the same question (Bobowik et al., 2010; Kurpis et al., 2008; La Barbera & Gürhan, 1997; Rice & McAuliffe, 2009).

I additionally look at several other control variables shown to potentially influence climate change perceptions. These are race, Hispanic heritage, age, gender, ideology, income, education, perceived seriousness of climate change as a problem (perceived seriousness), and existence in climate change. For the perceived seriousness variable, I ask respondents, "In your view, how serious a problem is climate change? Is it a…" Response options are, (1) very serious problem, (2) somewhat serious problem, (3) not too serious a problem, and (4) not a problem. To determine whether people think climate change is happening or not, I ask, "Which of these statements about the earth's temperature comes closest to your view?" Response options are,

[37] For further defense of this variable, see *Limitations and Future Research.*

(1) The earth is getting warmer mostly because of human activity such as burning fossil fuels, (2) The earth is getting warmer mostly because of natural patterns in the earth's environment, and (3) There is no solid evidence that the earth is getting warmer. Response option order was randomized. The remaining control variables are phrased as standard demographic questions.

3. Results and Discussion

I first aggregated the data to show general trends. As seen in Figure 2.1, most respondents (58.9%) think the utilitarian statement (*harm*) is the most persuasive reason to reduce the effects of climate change, 26.0% think the deontological statement (*duty*) is most persuasive, and 14.5% think the virtue ethics statement (*character*) is most persuasive. As a comparison, respondents were asked to rate their level of agreement to these statements in isolation: 67.4% of respondents "agree" or "strongly agree" with the *harm* statement, 66.7% "agree" or "strongly agree" with the *duty* statement, and 55.7% "agree" or "strongly agree" with the *character* statement. Although the majority of respondents "agree" or "strongly agree" with all ethical appeal statements, the overwhelming majority find an appeal to utilitarianism the most persuasive reason to reduce the effects of climate change. While it is expected that the majority of respondents would find the utilitarian and deontological statements most persuasive,[38] a considerable 14.5%—or about 1 in 7 people—think the most persuasive reason to reduce the effects of climate change is because *it is what people of good character do*. This small but non-negligible subsection of the United States believes that being a good person is a stronger reason to reduce the effects of climate change than the more traditional justifications given by deontology or utilitarianism.

[38] Prima facie, one might expect utilitarianism and deontology to be stronger ethical appeals for justification of an action.

Table 2.2 shows results from two-tailed multinomial logistic regression tests.[39] I find that for a one unit increase in religious importance, the multinomial log-odds of preferring *duty* over *harm* increases by 0.285 scale points ($p \leq 0.001$). This supports the hypothesis: the more religious people are, the more likely they will be to find a deontological appeal more persuasive than a utilitarian appeal when it comes to their ethical obligation to reduce the effects of climate change. The less religious people are, the more likely they will be to find an appeal to utilitarianism more persuasive than an appeal to deontology when it comes to their ethical obligation to reduce the effects of climate change. These results find support in the current literature and show that appropriate ethical framing can increase message persuasiveness among certain groups (Goodwin & Darley, 2008; J. Graham & Haidt, 2010; Piazza, 2012; Piazza & Sousa, 2014; Tetlock, 2003).

Some other significant findings from analysis are: with a one unit (one year) increase in age, the multinomial log-odds of preferring *harm* over *character* increases by 0.022 scale points, and the multinomial log-odds of preferring *duty* over *character* increases by 0.026 scale points ($p \leq 0.001$), holding all other variables in the models constant. This shows that the younger a person is, the more likely they will be to find an appeal to *character* more persuasive than an appeal to *harm* and *duty*. One reason for this finding might be because, given the language about reflection, respondents interpreted the virtue ethics appeal as a need to maintain a good reputation concerning climate change; if the value of reputation maintenance was captured, it might be considered something different than a pure virtue ethics appeal. Additionally, because of younger people's over-representation on social media platforms (Smith & Anderson, 2018), the statement might be tracking younger generations' attention to their public image, which can

[39] For tests of robustness of the results, see *Appendix 6. Tests of Robustness for Chapter 2.* For correlations of the independent variables, see *Appendix 7. Pearson Correlations of the Independent Variables of Chapter 2.*

be readily exposed to criticism. Further research is needed to disambiguate the responses to this statement and gain further confidence in and understanding of this measure. Future research should disentangle the importance of character from the importance of reputation.

Next, I considered the perceived seriousness variable. For a one-unit increase in believing climate change is a serious problem, the multinomial log-odds of preferring *harm* over *character* increases by 0.475 scale points ($p \leq 0.001$), and the multinomial log-odds of preferring *duty* over *character* increases by 0.285 scale points ($p \leq 0.05$), holding all other variables in the models constant. This means that those who do not think climate change is a serious problem are more likely to think *character* is the most persuasive reason to mitigate. Further, the multinomial log-odds of people who think the earth is not warming preferring *duty* over *harm* is a positive 0.778 scale points ($p \leq 0.01$), and *character* over *harm* is a positive 0.607 scale points ($p \leq 0.05$). This means that people who think climate change is not happening find an appeal to deontology or virtue ethics more persuasive than an appeal to utilitarianism (this is in comparison to those who think climate change is happening, either due mostly to human or natural causes). Again, the virtue ethics statement might be measuring a need to maintain public image or reputation; in which case, those who do not think climate change is a serious issue could still care about their reputation. Regardless, a virtue ethics frame as it is regarded in this study, could help to effectively involve individuals in mitigation and adaptation efforts who otherwise do not see climate change as a serious problem. If these self-reported preferences translate to observable behaviors, this finding will have even further significance and benefit to policymaking and climate change advocacy efforts. Overall, the virtue ethics appeal as it is comprehended in this study has a purpose in the framing of climate change messages.

The independent variable of race also displayed significant results. The multinomial log-odds of non-whites preferring *duty* over *character* is a positive increase of 0.720 scale points ($p \leq 0.05$). That is, whereas those who identify as white are more likely to prefer a virtue ethics appeal, those who identify as non-white are more likely to prefer a deontological appeal. While there is no theory to directly explain these findings, some studies show non-whites being more strongly in support of policy to reduce greenhouse gas emissions than whites (A. Leiserowitz & Akerlof, 2010). Further, a higher percentage of blacks than whites think that climate change is anthropogenically caused (Pew Research Center, 2015b). If the deontological statement is seen as more ethically demanding and urgent than the virtue ethics statement, pre-theoretical intuitions might point to non-whites preferring deontology over virtue ethics. Future research should include understanding why race plays a role in ethical appeal preference and how robust this finding is.

Figure 2.2 illustrates all statistically significant results, showing how findings can be made more accessible and understandable for policymakers, educators, researchers, and those generally interested in communication studies or climate change advocacy. Figure 2.3 graphically shows the relationship between the probability of each statement being chosen as most persuasive, and the independent variables of interest. These graphs illustrate how each independent variable affects the probability that one message with be ranked as more persuasive than others,[40] while simultaneously accounting for the effect from all independent variables of the study. Notice how even with the effect of all independent variables, religiosity is correlated to thinking the *duty* statement is the most persuasive. The probability of choosing the *duty* statement increases from 0.17 to 0.34 as one goes from religion being "not important at all" to

[40] Only for statistically significant variables.

it being "very important." Notice that religiosity's effect persists when considered in relation to the effects of all other independent variables—no other variable overtakes or masks religiosity's effect on choosing *duty* as most persuasive. The probability of choosing the *harm* statement as most persuasive goes from about 0.70 to 0.51 goes from religion being "not important at all" to it being "very important."

The probability of choosing the *duty* statement goes up with increasing age, whereas the probability of choosing the *character* statement goes down with increasing age. Although age is positively correlated with finding the *harm* statement more persuasive than the *character* statement, the effect of age on choosing *harm* as the most persuasive reason is visually negligible when seen together with the effects of all other independent variables. Whites have a higher probability of choosing *character* as first choice, and non-whites have a higher probability of choosing *duty* as first choice.

For the 'perceived seriousness' variable, the probability of choosing *harm* as most persuasive goes up with increasing perceived seriousness of climate change (from about 0.38 to 0.68). The probability of choosing *character* goes down with increasing perceived seriousness of climate change (from about 0.27 to 0.1). Uniquely, the probability of choosing *duty* as most persuasive goes *down* with increasing perceived seriousness of climate change. This is counter to statistical analysis, showing that increased perceived seriousness of climate change is correlated with a preference for *duty* over *character* and *harm* over *character*. Against the effects of all other independent variables, the effect on *duty* gets washed out, and does not persist.

Those who think the earth is warming have a higher probability of choosing *harm* than those who think there is no evidence the earth is warming. Those who think there is no evidence

the earth is warming have a higher probability of choosing *duty* and *character* than those who think the earth is warming. These graphs show that the statistically significant findings for the 'is the earth warming?' variable persist when considered against the effects of all other independent variables.

4. Limitations and Future Directions

The dependent variables are of my own creation and based on theoretical research and collaboration with professionals across disciplines, I have confidence that they are an adequate representation and appropriate measure of the three philosophical frameworks of deontology, utilitarianism, and virtue ethics as they relate to the individual's ethical obligation to reduce the effects of climate change. Based on findings, the virtue ethics statement might be tracking the need to maintain a good reputation or image, and while this is not directly a virtue ethics value, it is more closely related to virtue ethics than to the other two ethical frameworks. More research will be needed to disentangle how this statement is interpreted. Each ethical statement was also measured with only one item, which is a financial limitation of the study. Because theory in this sub-discipline is underdeveloped, there are inherent limitations in the ability to validate these measures. As more studies become available, findings should be compared and corrected if necessary.

This survey analyzes self-reported preferences, but it is unclear whether these preferences translate to heightened and observable pro-mitigation behavior. Inquiry along this line would further advance the utility and application of this study. This could include a follow-up survey on willingness to participate in pro-environmental behaviors or respondent interviews to garner a deeper understanding of how each ethical statement is interpreted.

Religiosity was also measured using a single item, which is a financial limitation. While some measures of religiosity include religious fundamentalism, Biblical literalism, prayer frequency, and church attendance, and may have proven explanatory to this research, some are specific to Christianity rather than religion in general, and my overall goal was to gauge religiosity across religions. Finally, other peer-reviewed articles use only one measures of religiosity, some even using the same question as I chose to use for this study (Bobowik et al., 2010; Rice & McAuliffe, 2009)

Regarding survey design, respondents were not given a "not applicable" option when asked to rank the persuasiveness of each ethical statement. This might be problematic in instances where climate skeptics are asked to rank each statement yet find no statement persuasive, or respondents find statements equally persuasive. Respondents did not have the option to rank statements as equally persuasive. To partially address this concern, respondents could skip the entire question without answering it or alternatively could rank one or two of the statements (rather than all three) and leave others blank if they did not find some or all persuasive.

5. Conclusion

In this study I determined under what circumstances Americans are likely to identify one ethically framed climate change message as more persuasive than others. Based on theoretical background, I hypothesized that religiosity would be positively correlated with a preference for a deontologically framed message over a utilitarian framed one. I founded this hypothesis on current literature and the framework's structural similarities to religious texts. Findings supported this hypothesis: religiosity is positively correlated to preferring a deontological reason to reduce the effects of climate change over a utilitarian reason ($p \leq 0.001$).

As I have shown here, selectively choosing how to ethically frame messages can alter message persuasiveness, and some demographic groups are statistically more likely to find one ethical framework more persuasive than others.

Values play a key role in designing messages intended to increase pro-environmental support among skeptical groups (Anthony Leiserowitz et al., 2016; Stern et al., 1999). This study offers insight into how ethical motivations affect the persuasiveness of messages about the individual's ethical obligation to reduce the effects of climate change and by doing so, adds to the literature on persuasive targeted climate change messaging. By framing climate change messages with a deontological appeal, we can effectively involve more of the religious community in the climate change conversation and potentially position climate change within the religious' moral domain of consideration. Overall, understanding more fully the effects of ethical message framing will continue to aid in the cultivation of best communication practices and the advancement of advocacy efforts, whether for climate change or other social issues.

Disclosure Statement

No potential conflict of interest was reported by the author.

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Tables and Figures

TABLE 2.1 shows relevant survey question and response options for the question.

1. Below are three reasons someone might give for reducing the effects of climate change. Which reason do you find most persuasive? Rank the order. (1=most persuasive, 3=least persuasive).

    a) Reducing the effects of climate change reflects our character and who we strive to be
    b) Harm will come to people if we do not reduce the effects of climate change
    c) We have a duty to protect the rights of people who will be affected by climate change

*A battery of standard demographic variables was used for statistical analysis, as well as a question on the perceived seriousness of climate change as a problem, and a question asking whether climate change is happening at all, is naturally or human-caused.

FIGURE 2.1. Bar graphs on the top (n = 1159) show results to the question: "Below are three reasons someone might give for reducing the effects of climate change. Which reason do you find most persuasive? Rank the order. (1 = most persuasive, 3 = least persuasive)." *Harm*: "Harm will come to people if we do not reduce the effects of climate change." *Duty*: "We have a duty to protect the rights of people who will be affected by climate change." *Character*: "Reducing the effects of climate change reflects our character and who we strive to be." Bar graphs on the bottom show respondents' level of agreement with these statements individually (not ranked) as a comparison.

TABLE 2.2 shows two-tailed multinomial logistic regression results to the question: "Below are three reasons someone might give for reducing the effects of climate change. Which reason do you find most persuasive? Rank the order. (1 = most persuasive, 3 = least persuasive)"* Results that are bolded are significant at the ($p \leq 0.05$) level or better.

Reference Category: Harm		**B**	**p-value**	**Confidence Intervals (95%)**	
				Lower Bound	**Upper Bound**
Character	Intercept	1.915 (0.897)	0.033	--	--
	Age	**-0.022 (0.007)**	**0.001**	**0.965**	**0.991**
	Gender	-0.155 (0.187)	0.407	0.594	1.235
	How serious a problem is climate change?	**-0.475 (0.124)**	**0.001**	**0.488**	**0.793**
	Ideology	0.030 (0.071)	0.673	0.896	1.185
	Religiosity	0.161 (0.104)	0.120	0.959	1.439
	Education	-0.098 (0.060)	0.100	0.806	1.019
	Income	0.035 (0.029)	0.236	0.977	1.097
	Hispanic Heritage	-0.440 (0.317)	0.166	0.346	1.200
	Non-white dummy	-0.426 (0.292)	0.144	0.369	1.157
	Christian dummy	-0.228 (0.228)	0.318	0.509	1.246
	Not warming dummy	**0.607 (0.296)**	**0.041**	**1.026**	**3.273**
Duty	Intercept	-0.819 (0.762)	0.283	--	--
	Age	0.004 (0.005)	0.455	0.993	1.015
	Gender	0.067 (0.150)	0.652	0.798	1.434
	How serious a problem is climate change?	-0.190 (0.102)	0.063	0.677	1.011
	Ideology	-0.002 (0.056)	0.964	0.894	1.113
	Religiosity	**0.285 (0.083)**	**0.001**	**1.130**	**1.566**
	Education	-0.054 (0.048)	0.262	0.863	1.041
	Income	0.002 (0.024)	0.942	0.956	1.050
	Hispanic Heritage	-0.119 (0.278)	0.670	0.515	1.532
	Non-white dummy	0.294 (0.197)	0.136	0.912	1.975
	Christian dummy	-0.170 (0.183)	0.354	0.589	1.208
	Not warming dummy	**0.778 (0.250)**	**0.002**	**1.334**	**3.554**
Reference Category: Duty		**B**	**p-value**	**Confidence Intervals (95%)**	
				Lower Bound	**Upper Bound**
Character	Intercept	-2.734 (1.005)	0.007	--	--
	Age	**-0.026 (0.008)**	**0.001**	**0.959**	**0.989**
	Gender	-0.222 (0.207)	0.283	0.534	1.202
	How serious a problem is climate change?	**-0.285 (0.136)**	**0.037**	**0.576**	**0.982**
	Ideology	0.033 (0.079)	0.679	0.885	1.206
	Religiosity	-0.124 (0.115)	0.278	0.705	1.105
	Education	-0.051(0.066)	0.498	0.840	1.088
	Income	0.033 (0.033)	0.310	0.970	1.102
	Hispanic Heritage	-0.321 (0.359)	0.371	0.359	1.466
	Non-white dummy	**-0.720 (0.311)**	**0.021**	**0.265**	**0.896**
	Christian dummy	-0.058 (0.250)	0.817	0.578	1.541
	Not warming dummy	-0.172 (0.301)	0.568	0.467	1.519

*Respondents who chose *character* as the most persuasive reason were coded as "1." Those who thought *harm* was the most persuasive reason was coded as "2" and those that found *duty* to be the most persuasive reason were coded as "3." Respondents' choices of second and third most persuasive reasons were ignored in this analysis, as most persuasive reasons were determined to be most relevant.

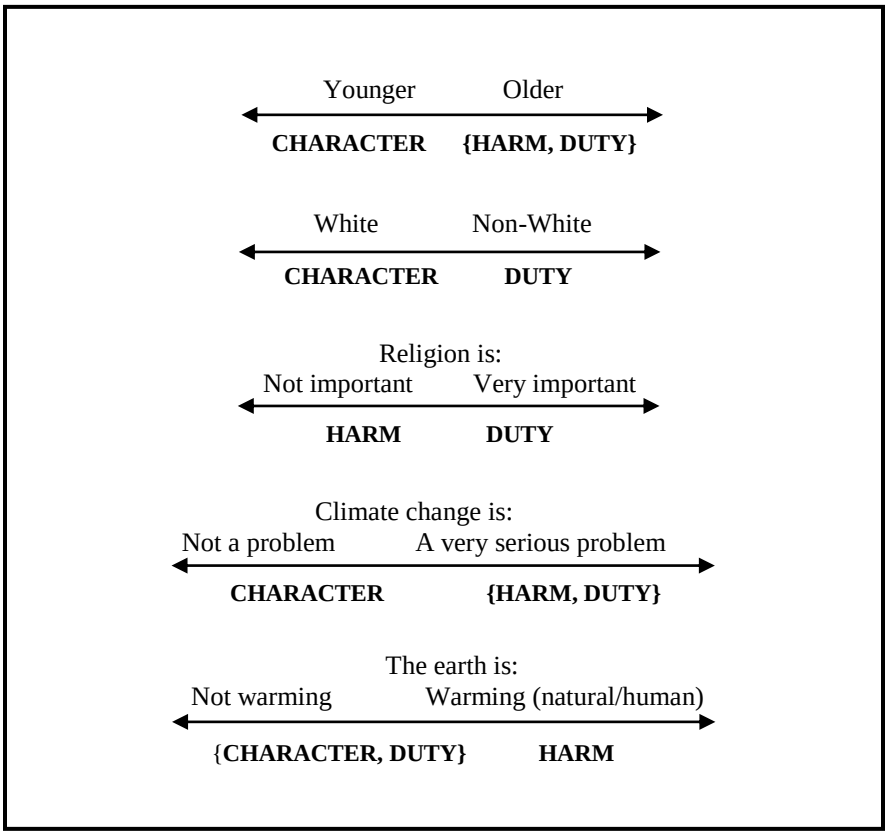
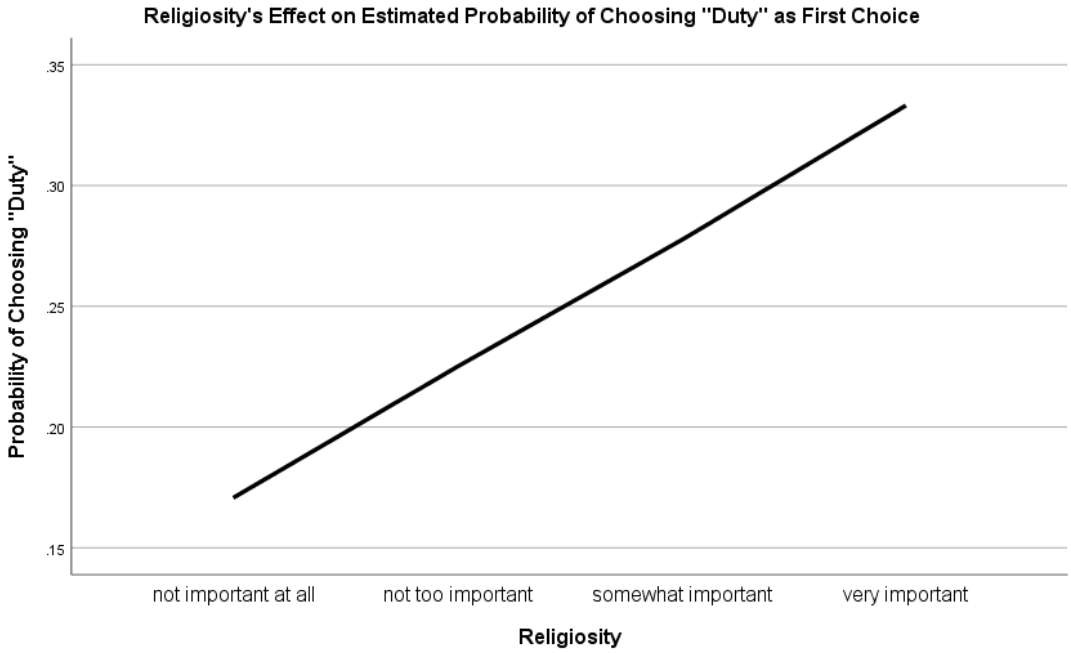
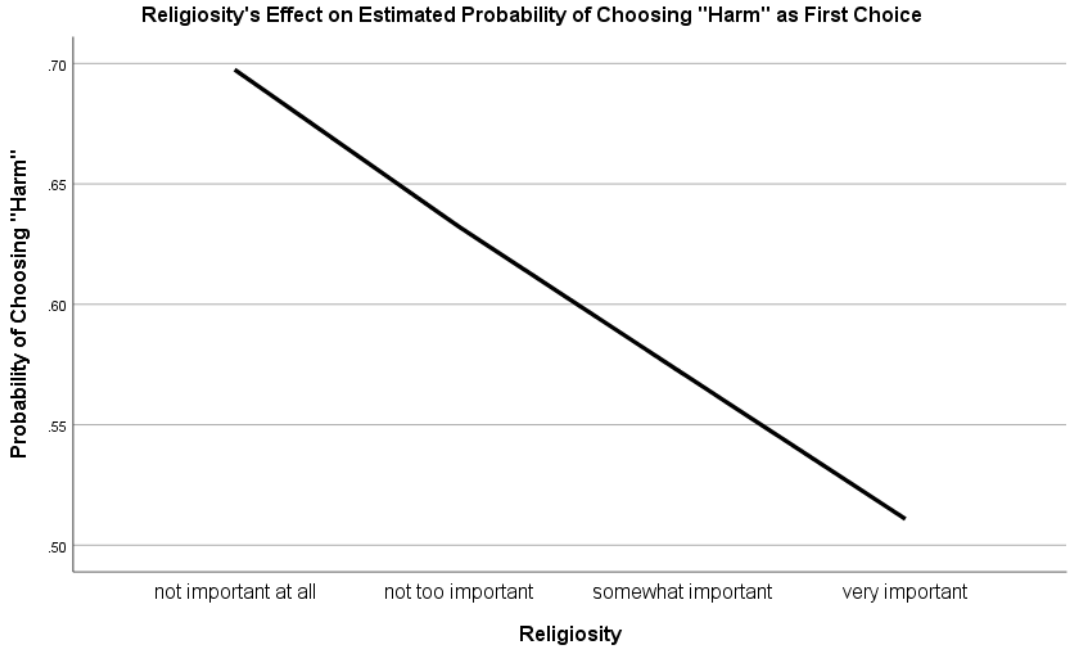


FIGURE 2.2 shows the relationship between ethical appeal preference and age, race, belief that climate change is a serious problem, religiosity, and whether the earth is warming or not, respectively. With an increase in age, there is an increased liklihood that a respondent will favor *harm* and *duty* over *character*. Non-whites are more likely than whites to prefer *duty* over *character*. With an increase in religious importance, there is an increased liklihood that a participant will prefer *duty* over *harm*. With an increase in belief that climate change is a serious problem, there is an increased probabality for a participant to prefer *harm* and *duty* over *character*. Those who think the earth is not warming prefer an appeal to *character* or *duty*, whereas those who think the earth is warming (either due to humans or natural causes) prefer an appeal to *harm*.

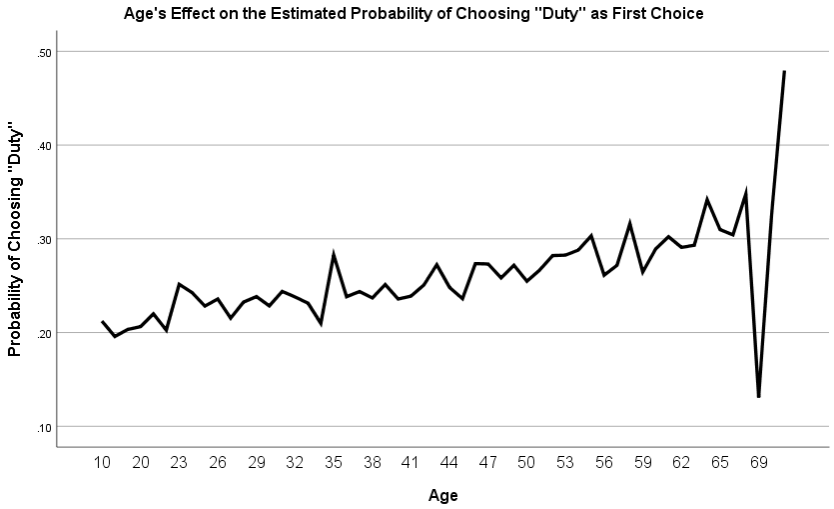
FIGURE 2.3 shows the effect of independent variables of religiosity, race, age, 'perceived seriousness of climate change,' and 'is the earth warming?' (from Figure 2.2), on choosing each ethical statement as most persuasive against the background of all other control variables. Only statistically significant relationships are shown. Spike in the age graph is due to fewer responses from older respondents.

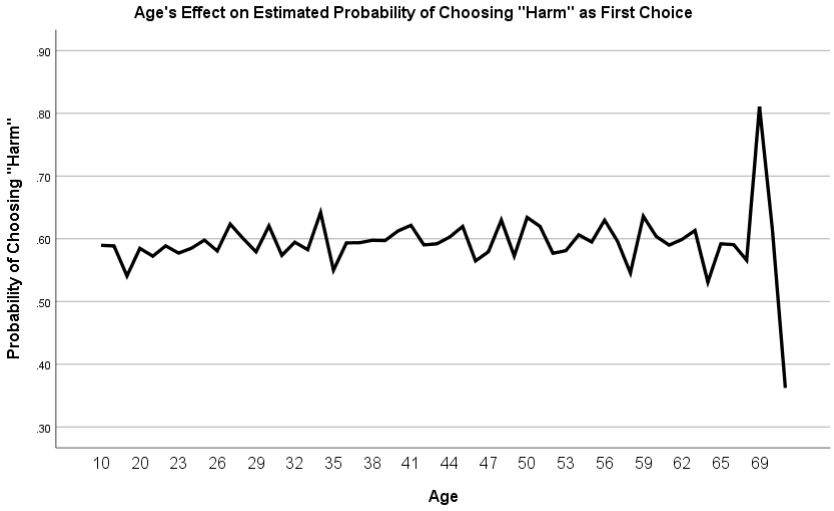
Religiosity

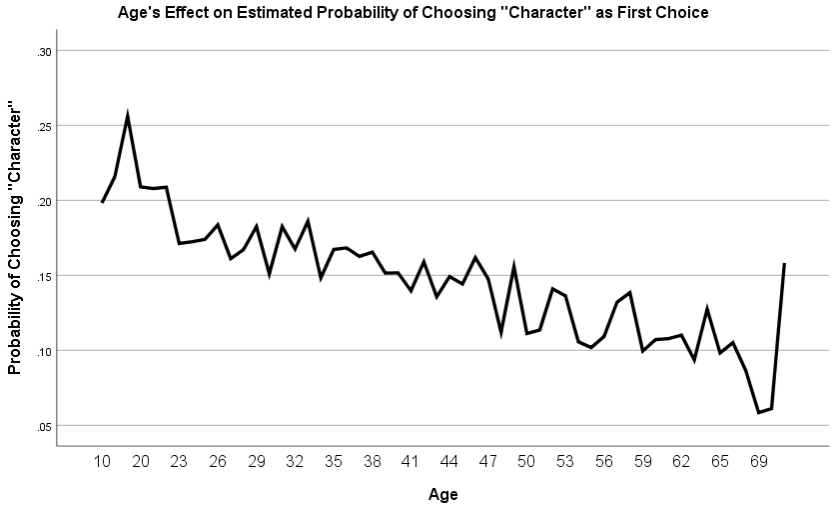




Age


Age's Effect on the Estimated Probability of Choosing "Duty" as First Choice
Probability of Choosing "Duty"
.50
.40
.30
.20
.10
10 20 23 26 29 32 35 38 41 44 47 50 53 56 59 62 65 69
Age


Age's Effect on Estimated Probability of Choosing "Harm" as First Choice
Probability of Choosing "Harm"
.90
.80
.70
.60
.50
.40
.30
10 20 23 26 29 32 35 38 41 44 47 50 53 56 59 62 65 69
Age


Age's Effect on Estimated Probability of Choosing "Character" as First Choice
Probability of Choosing "Character"
.30
.25
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.15
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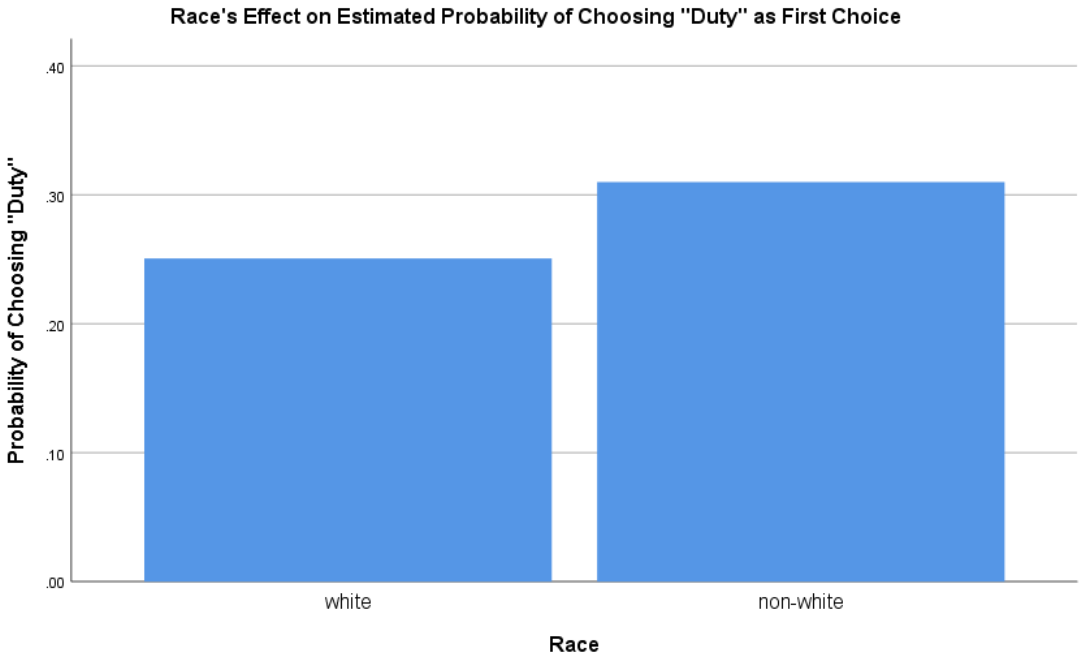
10 20 23 26 29 32 35 38 41 44 47 50 53 56 59 62 65 69
Age

Race


Race's Effect on Estimated Probability of Choosing "Duty" as First Choice
Probability of Choosing "Duty"
.40
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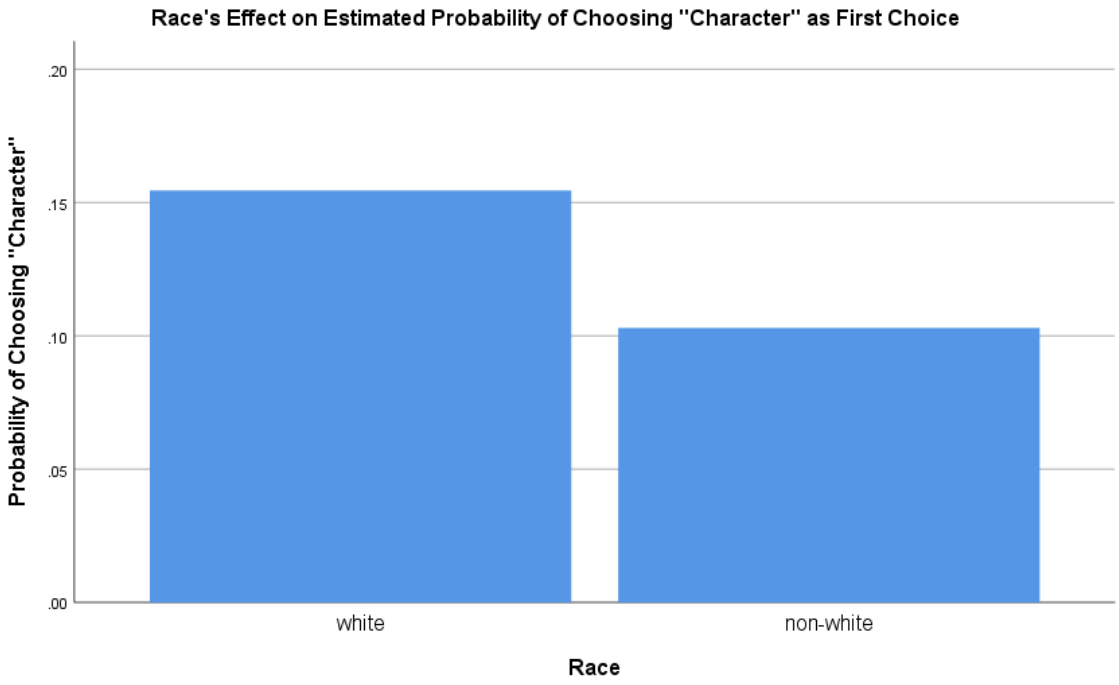
.10
.00
white
non-white
Race


Race's Effect on Estimated Probability of Choosing "Character" as First Choice
Probability of Choosing "Character"
.20
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white
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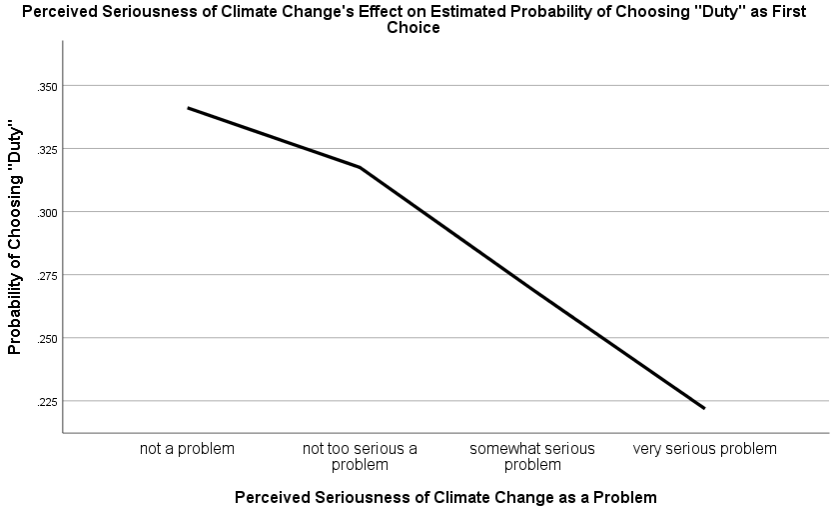
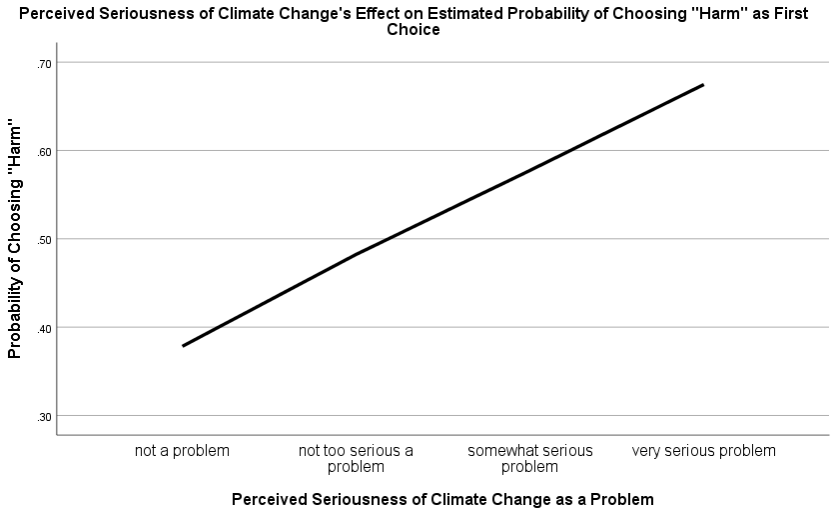
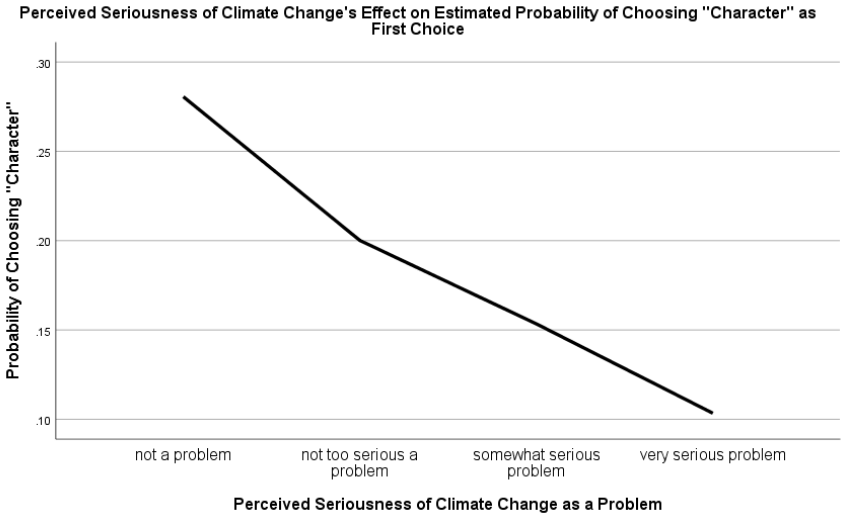
Race

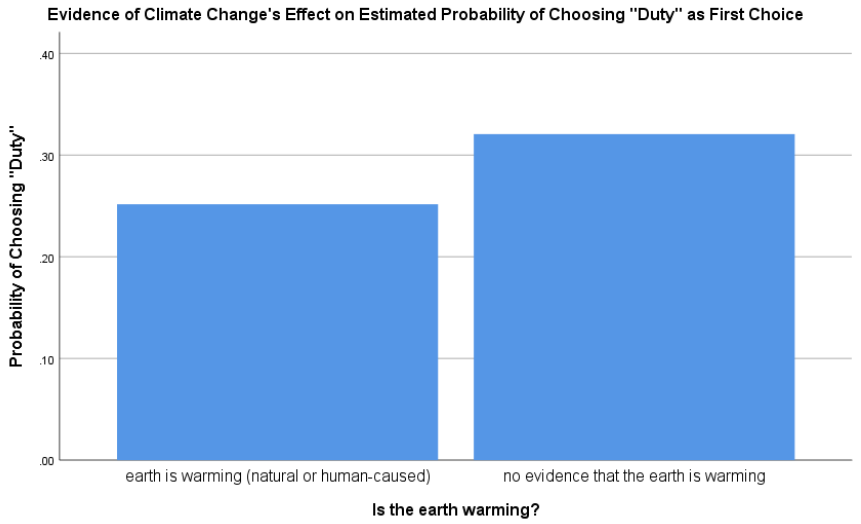
Perceived Seriousness of Climate Change as a Problem

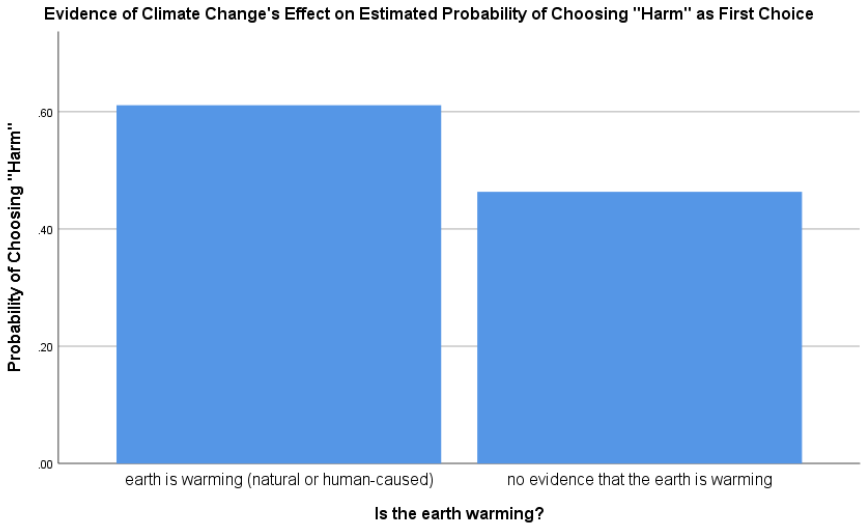


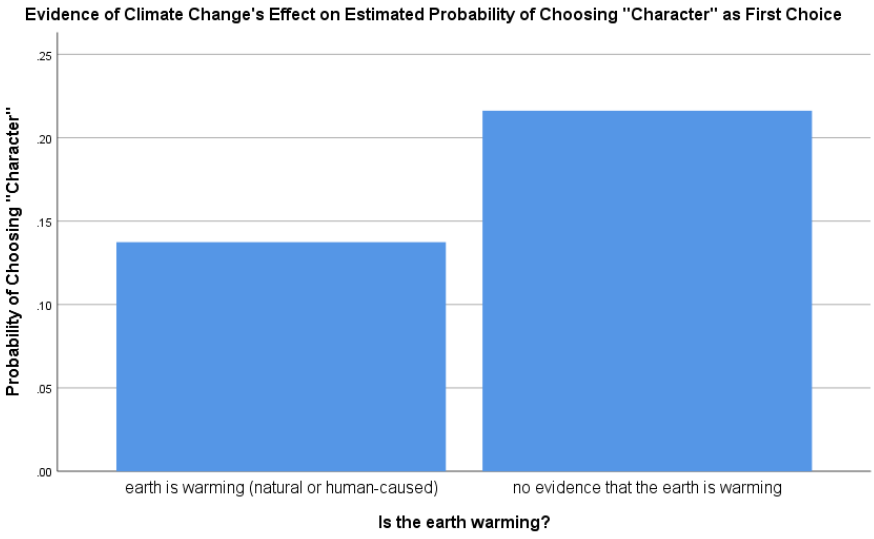




Is the earth warming?







Chapter 3: Americans' Ethical Perceptions of Climate Change: Understanding Some Nuances

Abstract

Across America, what types of people are more likely to think that climate change is an ethical issue? Are there particular character traits that are predictive of this belief? In a nationally representative survey (n=1,202) I ask respondents (1) whether their climate change beliefs are a reflection of their morals and, (2) whether decisions made to address climate change are an engagement in moral decision-making. Various demographic groups are more likely to find one *or* the other statement agreeable but, surprisingly, not both. The only variable with a statistically significant relationship to both measures is age: the younger someone is, the more likely they are to agree with both statements. Other significant relationships are found with political ideology, religiosity, Evangelicalism, perceived seriousness of climate change, and the perceived cause or existence of global average temperature increases. Findings show that Americans' perceptions of climate change as an ethical issue are nuanced and warrant continued research.

KEYWORDS: climate change beliefs, climate change ethics, public perceptions, survey

1. Introduction

This study determines whether the American public sees climate change as an ethical issue. It also uncovers which demographic groups are more likely to see it as such. Findings are more nuanced than I previously suspected, as the two measures used to gauge whether climate change is seen as an ethical issue yield divergent results across demographic groups. The first measure is referred to as the *decision-making* statement and is phrased: "When people think about what should be done about climate change, they are engaging in moral decision-making." The second measure is referred to as the *beliefs* statement and is phrased as: "My

beliefs on whether climate change is real or not are a reflection of my morals or ethics." The younger people are, the more likely they are to agree with both statements. Political ideology, religiosity, and non-Evangelical Christians (compared to Evangelical Christians) only correlate with one of the two statements.

To operationalize the objective of this study I measure the extent to which respondents see their climate change beliefs as moral beliefs and the extent to which respondents believe decisions made to address climate change are acts in moral decision-making. By measuring perceptions of climate change as (1) an anthropogenically caused event, (2) a serious problem, (3) a belief that has moral ramifications, and (4) something we are able to make moral decisions about, I describe the variations in Americans' opinions and how one measure may or may not relate to others. For instance, it seems counter-intuitive for someone to think climate change beliefs are ethical if they do not also think climate change is human-caused, but findings show that this is possible, and not necessarily irrational. I qualitatively describe what types of people think in this way and what should be concluded from these findings. I am additionally interested in how certain demographic groups respond to these ethical statements and if any group is more likely than others to think climate change is an ethical issue.

The findings from this study warrant continued research in the quantitative measurement of Americans' ethical intuitions about climate change. If we can attain a more accurate illustration of these perceptions, we can take the next steps needed to engage with the American public by advancing the idea of climate change as an ethical issue. This will be an increasingly important requirement in the advancement of environmentally-friendly policies.

2. The Ethics and Public Perceptions of Climate Change

Climate change is most easily identified as a scientific issue, with almost all climate scientists saying that climate change is largely anthropogenically caused (Cook et al., 2013). In reality climate change is more than just a scientific issue or an environmental issue, as it affects non-physical aspects of our lives. The looming consequences of climate change and the lack of action taken to address it have pushed many prominent philosophers to write on climate change's relevancy as an ethical issue.[41] I want to see if the American public also sees climate change as an ethical issue and in what ways. If and when climate change is addressed on the policy level, it might well be treated as an ethical issue because the larger American public sees it as such. Gauging climate change opinions will give a better indication of what sectors of the United States have already adopted the idea that climate change beliefs are moral beliefs and/or that climate change will have ethical ramifications. This will give a reasonable starting point to engage with others on these ideas as well as advance new ways to implement climate change policy.

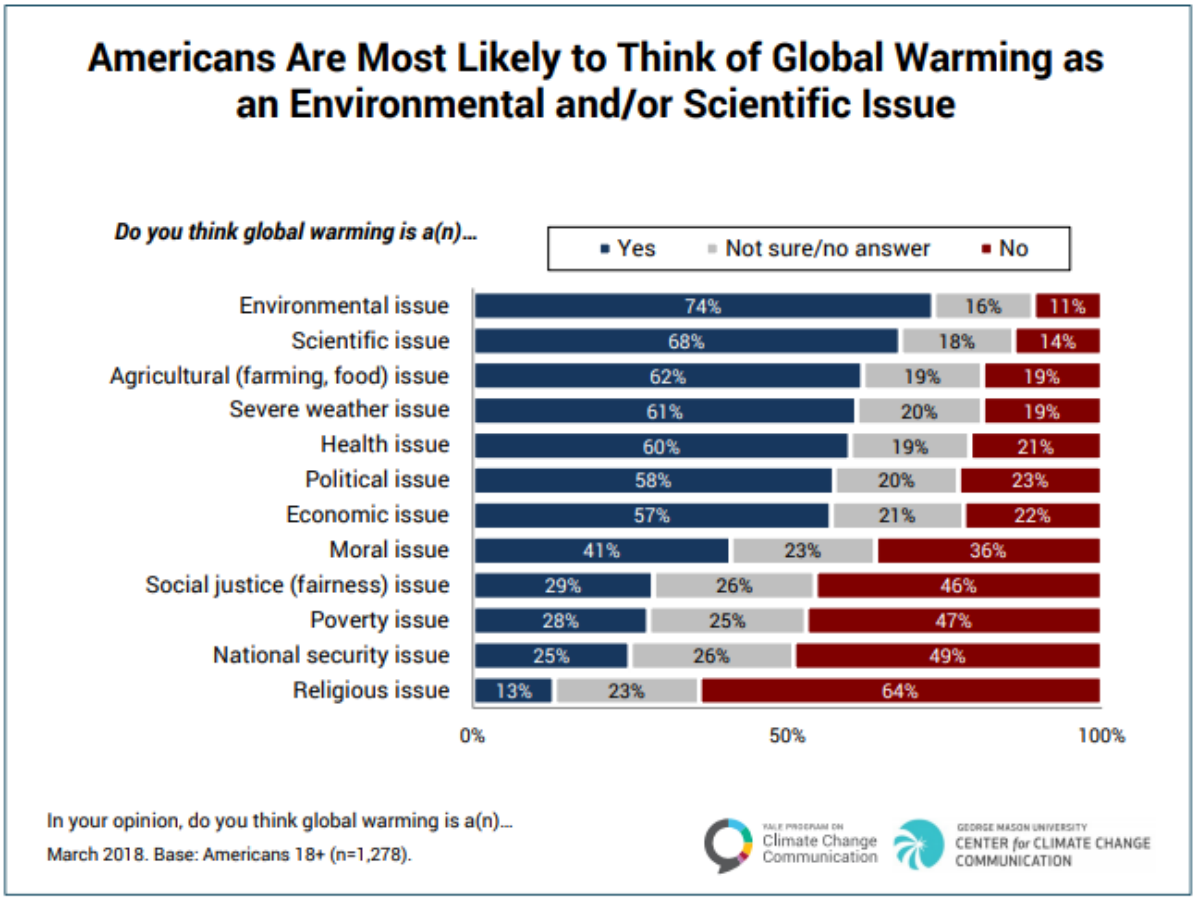
As seen in Table 3.1, the Yale Program on Climate Change Communication finds that the majority of Americans see global warming[42] as an environmental (74%), scientific (68%), agricultural (62%), or severe weather (61%) issue. A smaller but still substantial subsection of the American public sees it as a health (60%), moral (41%), social justice (29%) or religious (13%) issue (Anthony Leiserowitz et al., 2018). Further, the majority of Americans say the most important reason to reduce the effects of climate change is to provide a better future for our

[41] For example, see Broome's *Climate Matters*, John Gardiner's *The Perfect Moral Storm: The Tragedy of Climate Change, Climate Ethics: Essential Readings,* and others for contributions explaining the ethical aspects and ramifications of climate change (Broome, 2012; Brown, 2013; Caney & Bell, 2011; S. Gardiner, Caney, Jamieson, & Shue, 2010; S. M. Gardiner, 2011).

[42] The term "global warming" will be used when it is referred to as such by the study referenced. In all other instances the term "climate change" will be used.

children and grandchildren (24%), followed by preventing the destruction of most life on the planet (16%), and protecting God's creation (12%) (Anthony Leiserowitz et al., 2018). Some of these aforementioned reasons—which can be found in Table 3.2—are ethical in nature, whether they concern the consideration of future generations, the preservation of life, or the stewardship of nature. So while most people think climate change is a scientific or environmental issue (Table 3.1), the most popular reasons to address climate change are ethically based (Table 3.2). This gives justification for conducting further research to better understand how and in what ways people think of climate change as an ethical issue, and what demographic groups are statistically likely to see it as such. This research can eventually aid in best communication practices and advocacy techniques.

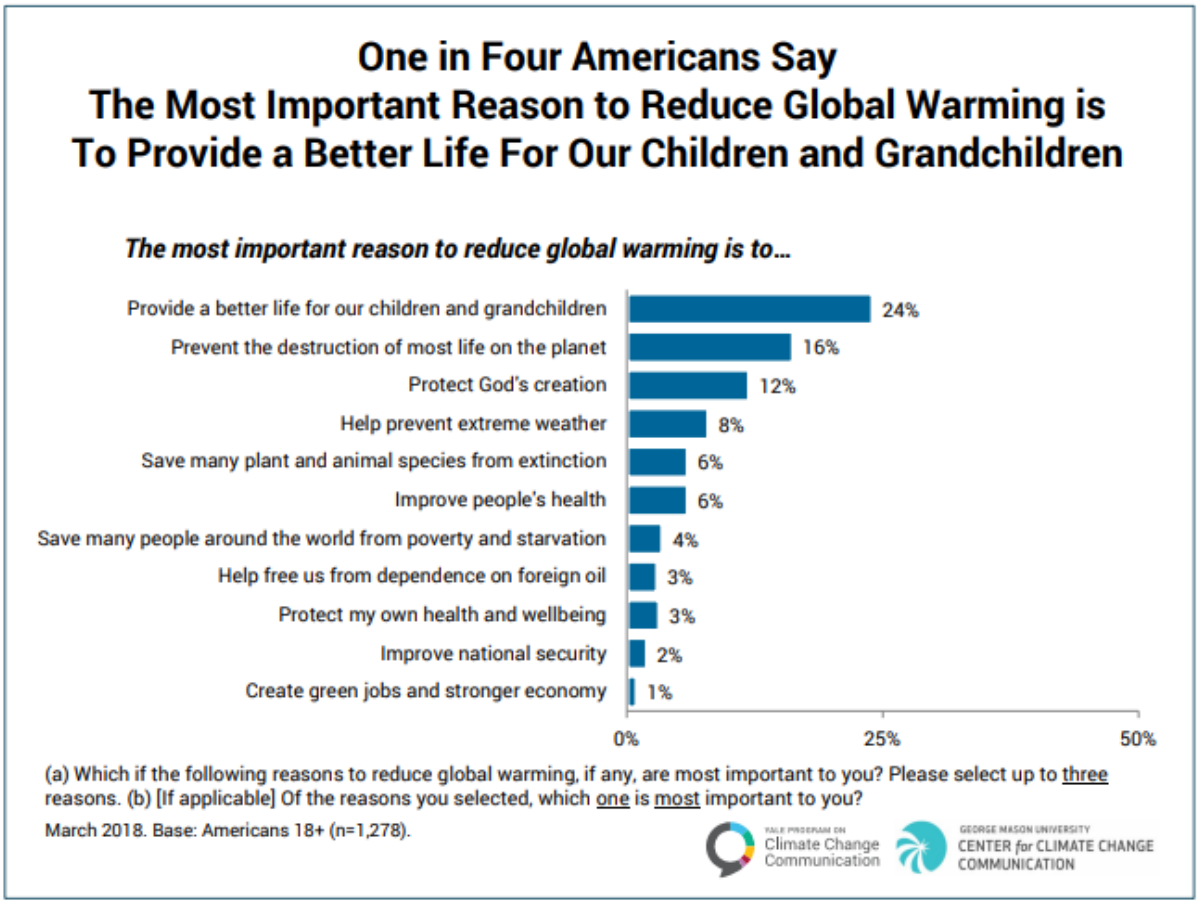
TABLE 3.1 While most Americans see global warming as an environmental or scientific issue, a significant amount see it as a health, moral, social justice, or religious issue.



Retrieved from Yale Program on Climate Change Communication.

In this study, I parse out the nuances of these perceptions and determine how Americans' perceptions about the existence and seriousness of climate change relate to ethical perceptions of climate change. I accomplish these objectives through quantitative analysis and some qualitative observations.

TABLE 3.2 Most Americans say that the most important reason to reduce global warming is to provide a better life for our children and grandchildren. Note that the majority of all reasons listed here are ethical in nature.



Retrieved from Yale Program on Climate Change Communication.

3. Data Measurement and Operationalization

I created the survey for this study using Qualtrics Survey Software, and I applied for an exemption under the Institutional Review Board (IRB), which was accepted under IRB Protocol 17-075. The survey (n=1,202) was administered by Survey Sampling International in February

of 2018 and is representative across the United States.[43] It took respondents an average of 5-7 minutes to complete and was administered fully online. The survey offers respondents statements about climate change's relevance as an ethical issue using two measures. A standard battery of demographic information was also collected.

3.1 Dependent Variables

To understand how Americans perceive climate change as an ethical issue, I employ two measures. The first statement is: "*When people think about what should be done about climate change, they are engaging in moral decision-making."* This statement gauges whether respondents agree that decisions made to address climate change produce consequences bearing ethical weight. This would place decisions such as biking to work rather than driving, or choosing a vegetarian over a meat option, in the realm of moral decisions. This behavior-relevant attitude measure is a first step to determining and facilitating a later behavioral response (Glasman & Albarracın, 2006). I refer to this statement as the *decision-making* statement.

The second statement is: *"My beliefs on whether climate change is real or not are a reflection of my morals or ethics*." I refer to this statement as the *beliefs* statement. With this statement, I aimed to determine whether individuals think their personal beliefs on climate change have moral facets. Agreement to this statement does not necessarily mean that a respondent is agreeing that climate change is real or that belief in this reality is good or right—there is no directionality in this respect. For instance, while it might be 'right' to believe that anthropogenic climate change is occurring and 'wrong' to deny it, it might also be 'wrong' to believe that anthropogenic climate change is occurring and 'right' to deny it; accepting either

[43] Refer to *Appendix 5. Nationally Representative Survey Data* for comparisons.

one of these ideas could lead a respondent to "agree" or "strongly agree" with the *beliefs* statement. Therefore, agreement to the *beliefs* statement does not necessarily clarify or describe the directionality of climate change as a moral belief, just that the belief, whatever it may be, has moral aspects. Directionality can be inferred by a more wholistic comparison of responses to other measures such as the existence of climate change, the perceived seriousness of climate change, and responses to the *decision-making* statement.

Both the *decision-making* statement and the *beliefs* statement measure different aspects of climate change as an ethical issue. Response options for both statements are coded (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, (5) strongly agree.

3.2 Independent Variables

Religiosity: For the religiosity measure respondents are asked, "How important is religion in your life?" Answer options for this ordinal variable are (1) not at all important, (2) not too important, (3) somewhat important, or (4) very important.

Religion Type: The categories for religion type are: Protestant, Roman Catholic, Mormon, Orthodox, Jewish, Muslim, Buddhist, Hindu, Atheist, Agnostic, "something else," or "nothing in particular." Those who identify as Christian were additionally asked if they were Evangelical or "born-again," to which response options were "yes, would" or "no, would not." I re-coded these categorical variables into four groups for statistical analysis: Non-Evangelical Christians, Evangelical Christians, Other Religious, and Non-Religious.

Age: Respondents were asked, "What year were you born?" Responses were organized as a pull-down list in which respondents could designate the appropriate year. Age was treated as a continuous variable.

Gender: Respondents were asked, “are you male or female?” This categorical variable was coded as (0) male (1) female.

Hispanic Heritage: Respondents were asked, “Are you of Hispanic, Latino, or Spanish origin, such as Mexican, Puerto Rican, or Cuban?” Response options were coded as (0) yes, (1) no. Hispanic Heritage is a categorical variable.

Race: Respondents were offered: “Which of the following describes your race? You can select as many as apply. White, Black, or African American, Asian or Asian American, or some other race.” Answer options are (1) “White (e.g., Caucasian, European, Irish, Italian, Arab, Middle Eastern),” (2) “Black or African-American (e.g., Kenyan, Nigerian, Haitian),” (3) “Asian or Asian American (e.g., Asian Indian, Chinese, Filipino, Vietnamese or other Asian origin groups),” (4) “Some other race (Specify),” with an included text box. I later recoded these items into the categorical dummy variable (0) non-white, (1) white.

Political Ideology: I asked respondents, “We hear a lot of talk these days about liberals and conservatives. Here is a seven-point scale on which the political views that people might hold are arranged from extremely liberal to extremely conservative. Where would you place yourself on this scale?” Answer options were coded as: (1) strongly conservative, (2) conservative, (3) slightly conservative, (4) moderate, middle of the road, (5) slightly liberal, (6) liberal, (7) strongly liberal. This is an ordinal variable in which higher values indicate increasing liberalism.

Party Identification: I offered, “In politics TODAY, do you consider yourself a Republican, Democrat, or independent?” Response options were Republican, Democrat, Independent, No preference, and Other Party. I then treated Republicans, Democrats and independents as dummy variables.

Annual Income: I asked, “Last year what was your total family income from all sources, before taxes?” Response options are (1) Less than $10,000, (2) $10,000-$19,999, (3) $20,000-$29,999, (4) 30,000-$39,999, (5) $40,000-$49,999, (6) $50,000-$59,999, (7) $60,000-$69,999, (8) $70,000-$79,999, (9) $80,000-$89,999, (10) $90,000-$99,999, (11) $100,000-$149,999, and (12) More than $150,000. Annual income was treated as a continuous variable.

Education Level: I asked respondents “What is the highest level of school you have completed or the highest degree you have received?” Answer options are (1) “Less than high school (Grades 1-8 or no formal education),” (2) “High school incomplete (Grades 9-11 or Grade 12 with NO diploma),” (3) “High school graduate (Grade 12 with diploma or GED certificate),” (4) “Some college, no degree (includes some community college),” (5) “Two year associate degree from a college or university,” (6) “Four year college or university degree/Bachelor’s degree (e.g., BS, BA, AB),” (7) “Some postgraduate or professional schooling, no postgraduate degree (e.g. some graduate school),” (8) “Postgraduate or professional degree, including master’s, doctorate, medical or law degree (e.g., MA, MS, PhD, MD, JD, graduate school).” This variable is continuous and higher values represent more education received.

Belief in anthropocentric climate change: I asked, “Which of these three statements about the earth’s temperature comes closest to your view?” Response options were: “The earth is getting warmer mostly because of human activity such as burning fossil fuels, “The earth is getting warmer mostly because of natural patterns in the earth’s environment, and “There is not solid evidence that the earth is getting warmer.” This variable is categorical, and I treated each response option as a dummy variable.

Perceived seriousness of climate change as a problem: I asked, "In your view, how serious a problem is climate change? Is it a…" Response options were, (1) Not a problem, (2) Not too serious a problem, (3) Somewhat serious problem, (4) Very serious problem. This is an ordinal variable in which higher values indicate increasing seriousness.

These variables were used as independent variables for multiple regression analysis along with the dependent variables. I additionally used "belief in anthropocentric climate change" and "perceived seriousness of climate change as a problem" as dependent variables, to which I ran multiple regression analysis with the remaining independent variables. I did this to see how demographic variables correlate with belief in human-caused climate change and the perceived seriousness of climate change. I specifically wanted to determine if (1) the belief in human-caused climate change or (2) the belief that climate change is a serious problem are necessary conditions for agreement to the *beliefs* and/or *decision-making* statements.

4. Results

4.1 Statistical Analysis

I ran multiple linear regression analysis to determine the effects of independent variables on the dependent variables.[44] These results are found in Table 3.3. Results are as follows:

Age: With a one year increase in age, there is a 0.008 unit decrease in agreement with the *decision-making* statement ($p \leq 0.001$) and a 0.006 unit decrease in agreement with the *beliefs* statement ($p \leq 0.05$). This small but significant relationship between age and thinking climate change is an ethical issue shows that the younger someone is, the more likely they are to agree with both item measures. Table 3.4 additionally shows that the younger someone is, the more likely they are to think that temperature increases are mostly human-caused (rather than

[44] Correlations of the independent variables can be found in *Appendix 9. Correlations of the Independent Variables of Chapter 3.*

naturally caused or not increasing at all). Somewhat muddling this illustration are results that show that younger people are no more likely than older people to think that climate change is a serious problem.

As polls have shown that younger individuals are more likely than older individuals to think that climate change is anthropogenically caused (Pew Research Center, 2015a, 2018), it tracks that younger people are more likely to think climate change is mostly anthropogenically caused *and* an ethical issue. In decades to come, the possibility of a cohort effect in which aggregate attitudes begin to shift towards becoming more climate sympathetic could be observed (Heberlein, 2012; Mortimer, Jeylan & Shanahan, 2004). This would transpire as younger generations replace older ones.

Political Ideology: With a one unit increase in political ideology, there is a 0.070 unit increase in agreement with the *decision-making* statement, but there is no correlation to the *beliefs* statement. It was suspected that political ideology would be correlated to both ethical statements, and with a stronger effect, since political ideology is one of the strongest predictors of pro-climate change beliefs with those who identify as liberal being more likely to sympathize or agree with climate change ideas (Pew Research Center, 2013b, 2015a, 2016). In this study, increasing liberalism is additionally correlated with an increased perceived seriousness of climate change as a problem and a higher likelihood that temperature increases are seen as mostly caused by humans (Table 3.4).

Religiosity: With a one unit increase in religious importance, there is a 0.117 unit increase in agreement with the *beliefs* statement ($p \leq 0.05$), but there is no correlation to the *decision-making* statement. As seen in Table 3.4, the more important religion is to someone,

the more likely they are to think climate change is a serious problem, but they are no more likely than others to think that climate change is human-caused.

Evangelicalism: There was a small but significant difference in the way non-Evangelical and Evangelical Christians respond to the *decision-making* statement, but no difference in how they answer the *beliefs* statement. Non-Evangelical Christians are more likely than Evangelical Christians to agree with the *decision-making* statement, with a 0.160 unit increase in agreement going from Evangelical to non-Evangelical Christian ($p \leq 0.05$). This is also coupled with the finding that non-Evangelical Christians are more likely than Evangelicals to think climate change is a serious problem, but no more likely to think climate change is human-caused. Non-religious people are also more likely than Evangelicals to think that climate change is a serious problem but show no difference in how they answer either of the ethical statements when compared to Evangelical Christians. This supports the assumption that the differences between these groups are not straightforward or necessarily due to theological differences on a broad scale.

Existence of human-caused climate change: Those who think warming is human-caused are more likely than those who think warming is naturally caused to agree with the *decision-making* and the *beliefs* statement (a 0.351 unit increase in agreement with the *decision-making* statement, and a 0.259 unit increase in agreement with the *beliefs* statement, going from warming being naturally caused to it being human-caused). While those who think climate change is human-caused are more likely to agree with the *decision-making* statement than those who do not think it is happening, there is a bigger difference in agreement between the "human-caused" and "naturally caused" dummy variables than between the "human-caused" and "not

happening" dummy variables.[45] To further complicate these relationships, those who think climate change is human-caused are no more likely to agree with the *beliefs* statement than those who think climate change is not happening. Although, those who think climate change is human-caused are more likely than others to think climate change is a serious problem.[46]

Perceived seriousness of climate change: With a one unit increase in the perceived seriousness of climate change as a problem, there is a 0.435 unit increase in agreement with the *decision-making* statement. There is no statistical correlation to the *beliefs* statement. The strong and significant correlation to the *decision-making* statement shows that if someone believes that climate change is a serious problem, then they will probably also think that decisions made to address climate change are ethical decisions.

4.2 Other Findings

Overall, results show that most Americans "agree" or "strongly agree" that their beliefs on whether climate change is real or not are a reflection of their morals or ethics. The majority also "agrees" or "strongly agrees" that when people think about what should be done about climate change, they are engaging in moral decision-making. According to the responses to these two measures the majority of the American public thinks climate change is an ethical issue to some degree. Figure 3.1 displays these results in a pie chart.

Although most Americans agree with both item measures, a statistically greater majority agree with the *decision-making* statement.[47] While it is unclear why this is the case, the *decision-making* statement might conjure a stronger sense of moral weight and agentic

[45] 0.343 unit increase in agreement going from human-caused to not happening, compared to a .351 unit increase in agreement going from human-caused to naturally caused.
[46] 0.925 unit increase in agreement going from naturally caused to human-caused, and 1.409 unit increase in agreement going from not warming to human-caused.
[47] A Paired t-test shows that responses to these two statements are statistically different, at the ($p \leq 0.001$) level. See *Appendix 8. Dependent Variable T-test of Chapter 3* for test.

moral responsibility in the respondent. The *decision-making* statement is also given in the third person rather than the first person, as the *beliefs* statement is.[48] In these ways and possibly others, the two measures likely measure slightly different concepts. For example, even if believing in X constitutes an ethical *belief,* it does not follow that deciding what should be done in regard to X always constitutes a moral *decision*.

Figure 3.2 shows a bar graph comparison of responses to the "perceived seriousness of climate change" variable, religiosity, and the *decision-making* and *beliefs* statements. Notice that there are a sizable number of respondents who say (1) religion is very important, (2) climate change is not a problem, yet (3) "strongly agree" with the *beliefs* statement. High religiosity appears to mediate the preference to "strongly agree" with the *beliefs* statement when the respondent does not otherwise find climate change to be a problem. Future research should include structural equation modeling to determine if this is the case. If so, one may not have to convey to the religious that climate change is a serious issue in order for them to see it as a moral issue.

Figure 3.3 extrapolates on this data. The "perceived seriousness of climate change" variable is a better predictor of agreement to the *decision-making* statement than the *beliefs* statement. This is also supported by statistical analysis. There is only one respondent who says climate change is not a problem and yet "strongly agrees" with the *decision-making* statement. Conversely, there are 15 respondents who say climate change is not a problem and yet "strongly agree" with the *beliefs* statement. This response pattern seemed perplexing, so I looked into what types of people, demographically, these respondents were. I did this to get a better

[48] The measures of this study contained statements in the first and third person; future measures should include additional statements in both the first and third person to determine if placing onus on the self versus the other changes one's perception of climate change as an ethical issue.

understanding of how these respondents might be interpreting the *beliefs* statement. Demographic data along with these 15 respondents responses to the *decision-making* statement and their perceptions of the existence of climate change can be found in Table 3.5. I find an overrepresentation of certain demographic traits and response options. All 15 respondents say that global average temperature increases are mostly naturally caused or not occurring. Fourteen out of 15 respondents "strongly disagree" with the *decision-making* statement. Thirteen out of 15 respondents are male. All 15 respondents are non-Hispanic whites, and most are Republican (12 strong Republicans, 1 Republican, 2 independent), and conservative (10 strongly conservative, 3 conservative, 1 slightly conservative, 1 moderate, middle of the road).

Based on these results, strong agreement to the *beliefs* statement does not necessarily mean that anthropogenically caused climate change is the "correct" moral belief. It is more likely the case that the "correct" moral belief for these respondents is to think that it is *not* anthropogenically caused. If this is seen as the "correct" moral belief, it would make more sense for respondents to report that climate change is not a problem because climate change is not anthropogenically caused, and it is morally right to think it is not anthropogenically caused. In this hypothetical case, the belief that climate change is real might be considered immoral because it is seen as a misinformed opinion. Decisions made to address climate change then, might not be seen as ethical because if climate change is not happening, then there are no decisions that need to be made to address it. Regardless, it seems clear that it is possible for:

i. An individual to think their beliefs about climate change being real/not real are a reflection of their morals/ethics

AND

ii. For this same individual to think there is no evidence for global average temperature increases

AND

iii. For this same individual to "strongly disagree" that decisions made to address climate change are exercises in moral decision-making

Understanding Americans' perceptions about the ethical facets of climate change shows that these perceptions are not straightforward nor are they intuitive. Rather, they are nuanced and need to be more fully exposed and understood. That some people can think climate change is not human caused yet also think beliefs about climate change are ethical opens up the possibility that a small subsection of people (who might otherwise be called "climate skeptics") have adopted the ideas of climate change into the moral realm. It is unknown, though, in what ways or to what extent morality has been extended to these ideas. Further research would be needed to more fully understand how and in what ways morality is applied.

5. Conclusion and Future Research

This study aimed to discover which demographic variables correlate to stronger agreement to ethical perceptions of climate change. Climate change as an ethical issue is likely more nuanced than previously supposed. While some demographic groups have strong pro-climate change attitudes (such as the politically liberal), they are not necessarily more likely to agree with both of the ethical statements presented in this study. Some demographic groups with generally weaker climate change attitudes remain likely to agree with at least one of the ethical measures. For instance, religious individuals are *not* more likely to think climate change is human-caused but *are* more likely to think it is a serious problem. They are also more likely to agree with the *beliefs* statement than the non-religious. Perceptions on (1) whether climate change exists, (2) whether it is a serious problem, and (3) whether it is an ethical issue or not, are not always congruent across demographic groups. This findings leads to the suspicion that

climate change attitudes are much more complex than previously supposed and often need to be understood in context.

Climate change beliefs can be seen as moral even if decisions made to address climate change are not seen as such. For that matter, the reverse can also be true. Further, people who do not think climate change is human-caused can still think climate change beliefs are moral. Continued research such as respondent interviews can be conducted to further understand how this group understands climate change beliefs as moral. In this way, qualitative research can help to inform quantitative research.

There are nuances to understanding climate change as an ethical issue, but these subtleties cannot be fully explained by one study. Future research is warranted to more fully understand the intricacies surrounding the ethical perceptions of climate change and how demographic traits can impact these perceptions. Future research should include additional measures to further define the nuances and complexities inherent to understanding climate change as an ethical issue. Such items might include additional measures of religiosity, and questions capturing respondents' occupations, relationship status, and number of children. Further measures could also have respondents assess the ethical relevancy of specific actions one can take to address climate change and assess if climate change denial is seen as an immoral belief.

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Tables and Figures

TABLE 3.3 shows multiple linear regression analysis (2-tailed) of the independent variables' effects on dependent variables (n=1,202). Results that are bolded are significant at the ($p \leq 0.05$) level or better.

	Decision-Making			
	B (st. error)	p-value	Confidence Interval (95%)	
			Lower Bound	Upper Bound
Constant	2.4503 (0.350)	0.001	1.716	3.089
Gender	-0.027 (0.059)	0.652	-0.143	0.090
Age	**-0.008 (0.002)**	**0.001**	**-0.012**	**-0.004**
Hispanic Heritage	-0.058 (0.109)	0.593	-0.271	0.155
White Dummy	0.120 (0.083)	0.151	-0.044	0.283
Political Ideology	**0.070 (0.026)**	**0.007**	**0.019**	**0.120**
Democrat dummy	-0.066 (0.091)	0.469	-0.244	0.112
Independent dummy	-0.017 (0.075)	0.817	-0.164	0.130
Annual Income	0.005 (0.010)	0.628	-0.014	0.023
Education level	0.006 (0.019)	0.756	-0.032	0.044
Religiosity	0.016 (0.039)	0.684	-0.060	0.092
Christian Non-Evangelical Dummy	**0.160 (0.080)**	**0.046**	**0.003**	**0.317**
Non-Religious Dummy	0.021 (0.118)	0.861	-0.210	0.252
Religious Non-Christian Dummy	0.069 (0.125)	0.580	-0.176	0.314
Not warming dummy	**-0.343 (0.120)**	**0.004**	**-0.578**	**-0.108**
Natural increases dummy	**-0.351 (0.087)**	**0.001**	**-0.521**	**-0.181**
Perceived Seriousness of CC	**0.435 (0.047)**	**0.001**	**0.342**	**0.528**
R^2	0.296 (0.977)	--	--	--
N	1202			

	Beliefs			
	B (st. error)	p-value	Confidence Interval (95%)	
			Lower Bound	Upper Bound
Constant	3.022 (0.431)	0.001	2.177	3.867
Gender	-0.129 (0.073)	0.078	-0.273	0.014
Age	**-0.006 (0.003)**	**0.027**	**-0.011**	**-0.001**
Hispanic Heritage	-0.193 (0.134)	0.149	-0.456	0.069
White Dummy	0.157 (0.102)	0.127	-0.044	0.358
Political Ideology	0.054 (0.032)	0.091	-0.009	0.116
Democrat dummy	0.125 (0.112)	0.263	-0.094	0.344
Independent dummy	0.049 (0.092)	0.593	-0.132	0.230
Annual Income	0.001 (0.012)	0.916	-0.022	0.024
Education level	-0.007 (0.024)	0.781	-0.053	0.040
Religiosity	**0.117 (0.048)**	**0.014**	**0.024**	**0.211**
Christian Non-Evangelical Dummy	-0.009 (0.099)	0.926	-0.203	0.184
Non-Religious Dummy	0.155 (0.145)	0.283	-0.129	0.439
Religious Non-Christian Dummy	-0.038 (0.154)	0.804	-0.340	0.264
Not warming dummy	-0.253 (0.148)	0.087	-0.542	0.037
Natural increases dummy	**-0.259 (0.107)**	**0.015**	**-0.469**	**-0.050**
Perceived Seriousness of CC	0.111 (0.058)	0.058	-0.004	0.226
R^2	0.067 (1.203)	--	--	--
N	1202			

TABLE 3.4 shows multiple linear regressions analysis (2-taild) of the independent variables' effects on the existence of anthropogenic climate change and on the perceived seriousness of climate change (n=1,202). Results that are bolded are significant at the ($p \leq 0.05$) level or better.

	Increased temperatures mostly caused by humans			
	B (st. error)	p-value	Confidence Interval (95%)	
			Lower Bound	Upper Bound
Constant	0.374 (0.135)	0.006	0.109	0.639
Gender	0.021 (0.025)	0.398	-0.028	0.071
Age	**-0.003 (0.001)**	**0.001**	**-0.005**	**-0.002**
Hispanic Heritage	-0.087 (0.046)	0.060	-0.177	0.004
White Dummy	-0.040 (0.035)	0.259	-0.109	0.029
Political Ideology	**0.099 (0.010)**	**0.001**	**0.079**	**0.120**
Democrat dummy	**0.188 (0.038)**	**0.001**	**0.113**	**0.263**
Independent dummy	0.049 (0.032)	0.123	-0.013	0.112
Annual Income	-0.001 (0.004)	0.839	-0.009	0.007
Education Level	**0.017 (0.008)**	**0.041**	**0.001**	**0.033**
Religiosity	-0.002 (0.016)	0.891	-0.034	0.030
Christian Non-Evangelical Dummy	-0.001 (0.034)	0.998	-0.067	0.067
Non-Religious Dummy	0.049 (0.050)	0.326	-0.049	0.147
Religious Non-Christian Dummy	-0.010 (0.053)	0.845	-0.115	0.094
R^2	0.276 (0.417)	--	--	--
N	1202			

	Perceived Seriousness of Climate Change			
	B (st. error)	p-value	Confidence Interval (95%)	
			Lower bound	Upper bound
Constant	3.004 (0.198)	0.001	2.615	3.392
Gender	**0.162 (0.036)**	**0.001**	**0.091**	**0.234**
Age	-0.001 (0.001)	0.486	-0.004	0.002
Hispanic Heritage	**-0.151 (0.067)**	**0.025**	**-0.283**	**-0.019**
White Dummy	**-0.130 (0.051)**	**0.011**	**-0.231**	**-0.029**
Political Ideology	**0.138 (0.015)**	**0.001**	**0.108**	**0.169**
Democrat dummy	0.033 (0.056)	0.554	-0.077	0.144
Independent dummy	0.028 (0.046)	0.547	-0.063	0.119
Annual Income	-0.003 (0.006)	0.663	-0.014	0.009
Education Level	-0.009 (0.012)	0.447	-0.032	0.014
Religiosity	**0.054 (0.024)**	**0.023**	**0.007**	**0.101**
Christian Non-Evangelical Dummy	**0.107 (0.050)**	**0.031**	**0.010**	**0.204**
Non-Religious Dummy	**0.231 (0.072)**	**0.001**	**0.089**	**0.373**
Religious Non-Christian Dummy	0.104 (0.077)	0.178	-0.048	0.256
Natural increase dummy	**-0.925 (0.046)**	**0.001**	**-1.016**	**-0.834**
Not warming dummy	**-1.409 (0.062)**	**0.001**	**-1.530**	**-1.288**
R^2	0.595 (0.605)	--	--	--
N	1202			

FIGURE 3.1 Sixty-six percent of Americans agree or strongly agree that thinking about what should be done about climate change is an engagement in moral decision-making (n=1,202). Forty-six percent of Americans agree or strongly agree that beliefs on whether climate change is real or not has to do with morals/ethics. There is a distinction made between what someone thinks should be done about climate change (*decision-making*) vs. the beliefs they have about the existence of climate change (*beliefs*). While what we think should be done about climate change has more to do with morals, our beliefs in the existence of climate change are seen as having less to do with it.

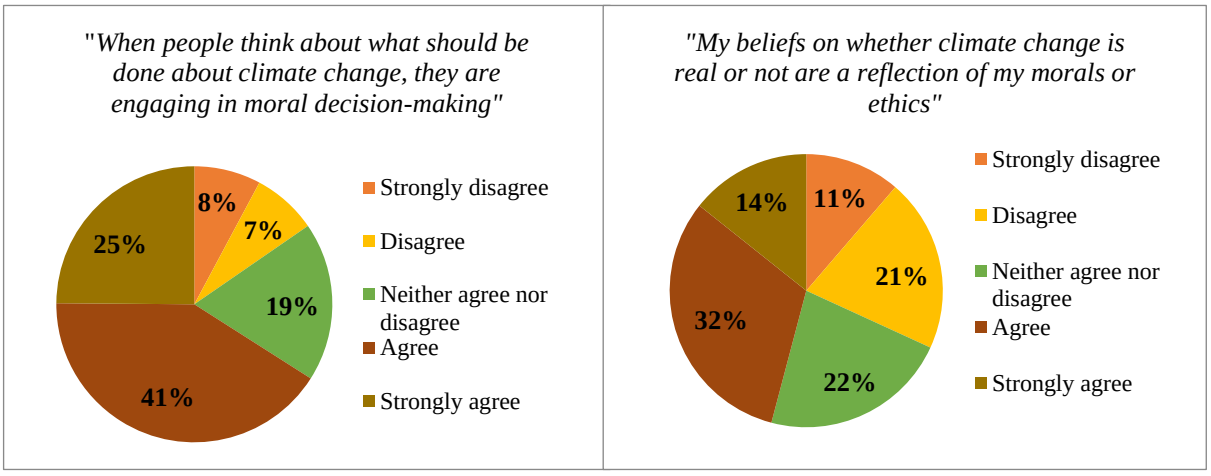
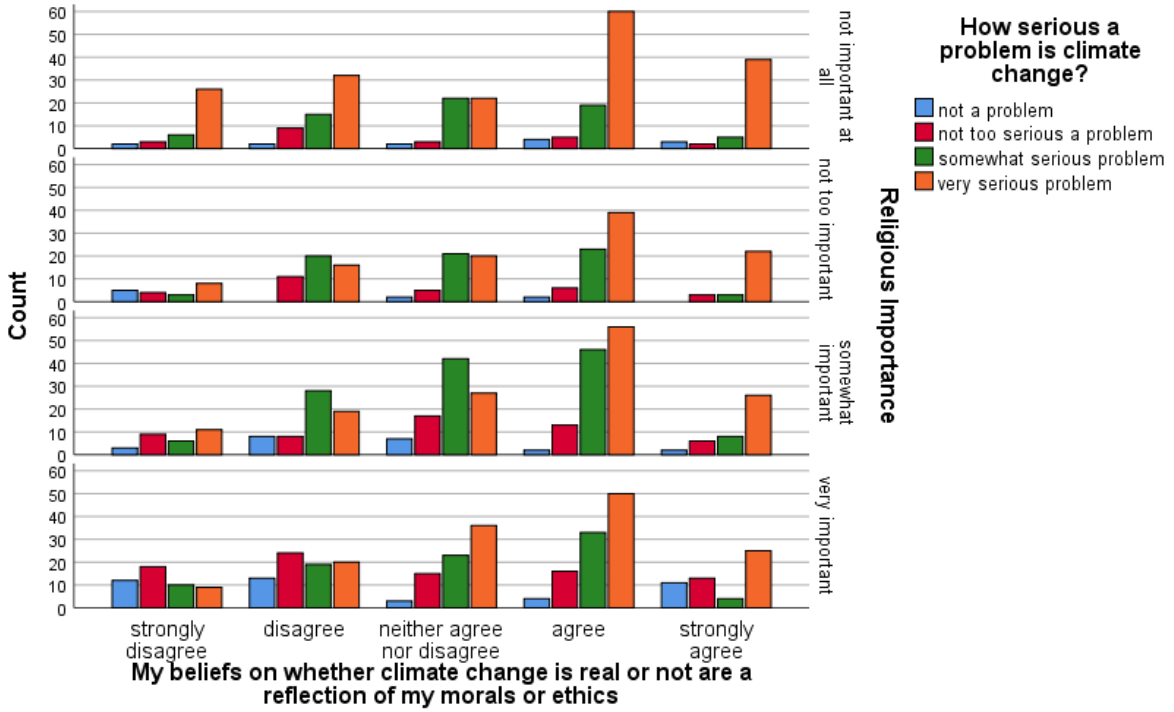


FIGURE 3.2 Bar graphs show the comparison between responses to the "perceived seriousness of climate change" variable, religiosity, and the *decision-making* and *beliefs* statements. Notice for the *beliefs* statement, that there is a considerable number of respondents who are very religious, think climate change is not a problem, yet "strongly" agree with the *beliefs* statement. This is not as strongly observed with the *decision-making* statement.



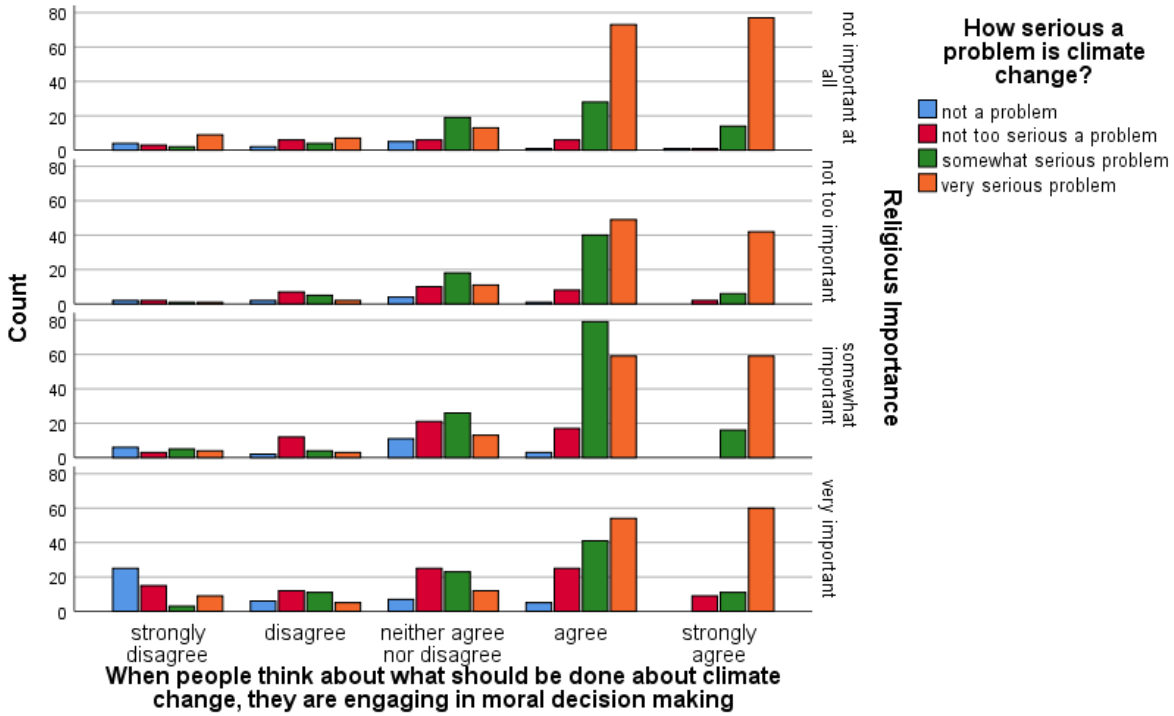
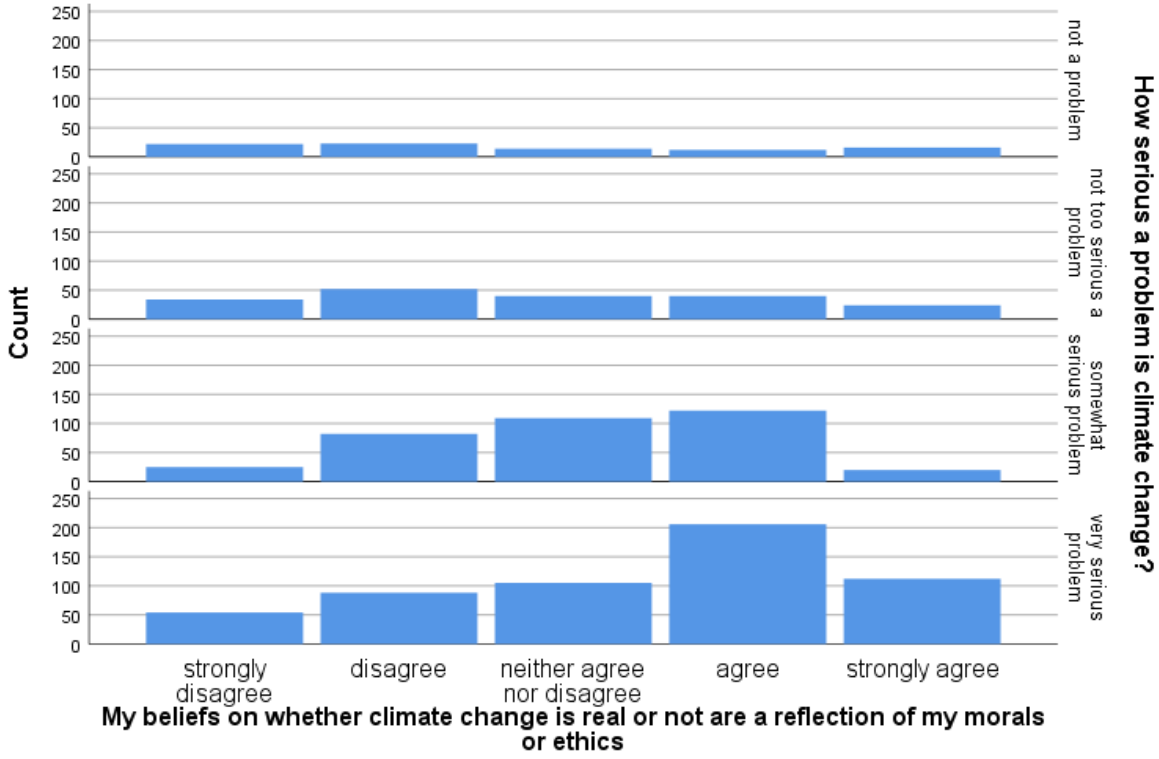


FIGURE 3.3 shows the relationship between responses to the "perceived seriousness of climate change" variable and the *decision-making* and *beliefs* statements. Note that some respondents said that climate change is not a problem yet "strongly agree" with the *beliefs* statement (top chart). This occurrence is not seen with the *decision-making* statement (bottom chart).



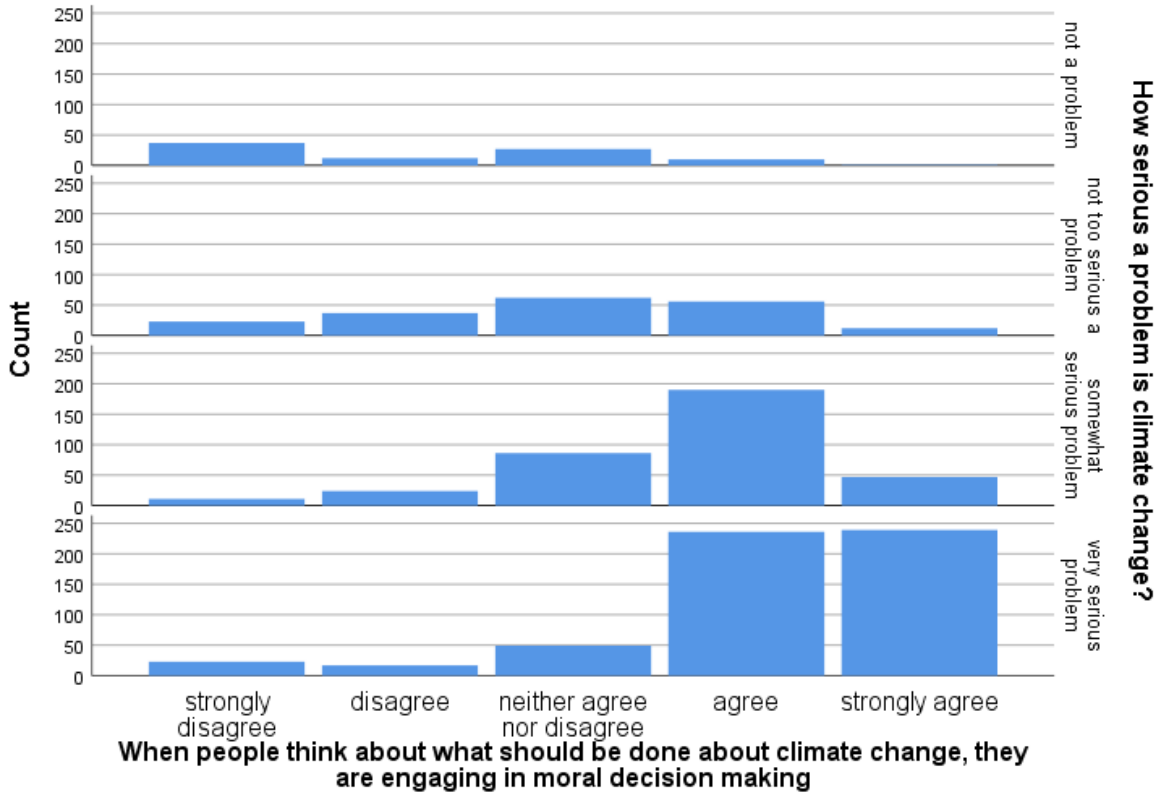


TABLE 3.5 shows the demographic makeup of those who say climate change was not a problem yet "strongly agree" with the *beliefs* statement. Almost all of these respondents "strongly disagree" with the *decision-making* statement and think that global average temperature increases are either naturally caused or not occurring. These respondents are mostly non-Hispanic white males who are likely Republican and conservative. For the income and school variables, higher numbers are representative of more schooling and/or greater incomes.

Global average temperature increases	*Decision-making* statement	sex	age	Hispanic	Race	Party ID	School	Income	Religion	Political Ideology	Religious Importance
Naturally caused	Strongly disagree	M	19	No	white	Strong Republican	3	12	Roman Catholic	Strongly Conservative	Very important
Not warming	Strongly disagree	M	66	No	white	Strong Republican	3	2	Evangelical Protestant	Strongly Conservative	Very important
Naturally caused	Strongly disagree	M	39	No	White	Independent	7	8	Nothing in particular	Slightly Conservative	Not at all important
Not warming	Strongly disagree	M	62	No	White	Independent	7	12	Evangelical Protestant	Conservative	Very important
Not warming	Strongly disagree	M	54	No	White	Strong Republican	5	5	Something else	Strongly Conservative	Very important
Not warming	Strongly disagree	F	59	No	White	Strong Republican	1	4	Evangelical Protestant	Strongly Conservative	Somewhat important
Not warming	Strongly disagree	M	52	No	White	Strong Republican	6	12	Roman Catholic	Conservative	Somewhat important
Naturally caused	Strongly disagree	M	30	No	White	Strong Republican	4	6	Protestant	Strongly Conservative	Very important
Not warming	Strongly disagree	F	56	No	White	Strong Republican	4	6	Evangelical Protestant	Strongly Conservative	Very important
Naturally caused	Strongly disagree	M	30	No	White	Strong Republican	8	8	Mormon	Strongly Conservative	Very important
Naturally caused	Strongly disagree	M	58	No	White	Strong Republican	3	11	Jewish	Strongly Conservative	Very important
Naturally caused	Strongly disagree	M	51	No	White	Republican	8	9	Roman Catholic	Moderate, middle of the road	Not at all important
Naturally caused	Strongly disagree	M	44	No	White	Strong Republican	4	1	Evangelical Protestant	Strongly Conservative	Very important
Naturally caused	Strongly agree	M	29	No	White	Strong Republican	4	2	Roman Catholic	Strongly Conservative	Not at all important
Not warming	Strongly disagree	M	35	No	White	Strong Republican	6	6	Evangelical Protestant	Conservative	Very important

Chapter 4: Ethical Structures of the Kyoto Protocol & the Paris Agreement: The Move to Virtue Ethics

Abstract

Policy structure can support or hinder the adoptability and outcomes of policy and because of this, structure analysis is a warranted endeavor. This is especially true of far-reaching legislation considered too important to fail. Ethics represents one underrepresented lens through which we can assess and analyze policy structure. In this paper I analyze different ethical structures—frameworks appealed to in the formulation of policy—used by two international agreements on carbon mitigation: The Kyoto Protocol and the Paris Agreement. The Kyoto Protocol has a rule utilitarian structure: nations must decrease their emissions per amounts prescribed by the agreement. In contrast, the Paris Agreement uses a virtue ethics structure, which implicitly appeals to nations' reputations by requesting voluntary plans. I show that the move from utilitarianism to virtue ethics changes these policies structures and could in turn constructively affect policy adoptability and implementation.

KEYWORDS: virtue ethics, Paris Agreement, Kyoto Protocol, climate policy, ethical structures

1. Analysis of Mitigation Policy

One quality of policy analysis is the ability to improve future policy by understanding the pros and cons of past legislation. This endeavor is especially relevant and timely as it pertains to climate policy, which often aims to establish mitigation legislation in a time-sensitive manner. In general, carbon mitigation is universally accepted as good and necessary, but many countries have yet to actively adopt standards in reflection of this ideal. Because climate treaties lack international enforcement, the success of mitigation adoption lies with each

individual country adopting the treaty into law and creating national regulations to enforce it. Knowing that policy structure can influence the adoption of climate policy, analyzing this structure is warranted to understand how these structural aspects affect adoptability. The Kyoto Protocol and Paris Agreement are fitting candidates for this analysis because they both frame climate mitigation policy based on the objectives found in the United Nations Framework Convention on Climate Change (UNFCCC). Further, when the last commitment period of the Kyoto Protocol expires in 2020, the Paris Agreement will go into effect. The Paris Agreement upholds the same objectives and goals as the Kyoto Protocol, but wields a different policy structure (UNFCCC, 2014). I analyze how these structures mirror two different ethical orientations.

1.1 Ethical Structures Used in Policy Analysis

The Kyoto Protocol and Paris Agreement contain different ethical structures. Ethical structures as they are referred to in this paper are ethical frameworks appealed to in the formulation of policy. These ethical frameworks help to create the structural differences between policies. Each policy's ethical structure consists of either implicit or explicit appeals to ethical frameworks such as utilitarianism, virtue ethics, or deontology. This paper examines the differences between these ethical structures and the effects they might create, and I find that an ethical structure incorporating virtue ethics (as in the Paris Agreement) could produce positive effects for the adoptability of the treaty.

Common studies in policy analysis include the determination of policy performance, target objectives, and optimal evaluation methods (Cohen, 2015; Hansson, 2012; Hook, 1970; Wolff, 2011). Philosophical applications traditionally include the assessment of policy motives using value systems or ethical frameworks (Cohen, 2015). Considerations typically include

what the content of policy should be, or the reasons behind why policy is being written. Far less research has been conducted on how to implement these undertakings. This analysis focuses on accomplishing the latter by analyzing and comparing the ethical structures of the Kyoto Protocol and Paris Agreement.

Both the Kyoto Protocol and the Paris Agreement have the similar objectives but because of their ethical structures, two different solicitations are made: a rule and a request. As I explain in Section 3, the Kyoto Protocol structures carbon mitigation as a rule; countries are to reduce carbon emission levels 5% below 1990 levels by the year 2012. This ethical structure consists largely of rule utilitarianism appeals: right actions are those consistent with rules that, if followed, would result in the greatest expected good (Washington, 2000). According to utilitarianism, an action is right if it maximizes the total or average utility of a situation (Washington, 2000). Because mitigating carbon emissions aids in the reduction of negative outcomes projected to be extreme or endangering to human welfare, it is a good and right action to take in response to climate change, and it has very high utility. This action is operationalized as a rule to facilitate developed countries in fulfilling their moral obligations outlined in the UNFCCC.

As shown in Section 3, the Paris Agreement appeals to virtue ethics with its use of Nationally Determined Contributions (NDCs), in which it requests voluntary reduction plans. This structure appeals to countries' national character and international reputations. As NDCs are submitted on a recurring basis, nations are expected to offer their best contributions and strengthen them as they obtain the means and abilities to do so. What makes a character trait a virtue is its conduciveness to realizing and promoting certain desirable ends (Sandler, 2007). It is a virtue then, to put forth aggressive NDCs in order to curb the negative effects of climate

change and to care that these negative effects will otherwise cause harm. Moreover, virtues are strengthened when they are practiced. The structure of NDCs encourages this ideal by having each nation submit consecutive contributions, allowing countries to continually strengthen their virtues and shape their international reputations. As an individual's actions speak to his or her character, each nation's pledge says something about its character.

In what follows I illustrate that an ethical structure including virtue ethical appeals highlights national character and reputation and in doing so, encourages full international cooperation. Because of these features, the Paris Agreement positions itself to be more inclusive than the Kyoto Protocol.

1.2 Virtue Ethics

Although virtue ethics dates back to the time of Plato and Aristotle (Aristotle, 340BC; Berges, 2009; Hursthouse, 1999), it has found comparatively new applications in contemporary moral theory. Because of Anscombe's contribution of *Modern Moral Philosophy*, followed by others such as Alasdair MacIntyre's *After Virtue*, Philippa Foot's *Virtues and Vices*, and Paul Ricoeur's *Oneself as Another*, virtue ethics has risen in popularity as a major ethical framework within the last few decades (Anscombe, 1958; Foot, 2002; Hursthouse & Pettigrove, 2016a; MacIntyre, 2007; Ricoeur, 1992). Virtue ethics is now one of three main ethical frameworks—the others traditionally being deontology and utilitarianism. Unlike deontology's focus on the moral agent's duty, or utilitarianism's attention to an action's consequences, virtue ethics focuses on the moral agent's character. According to virtue ethics, one's intentions or reasons for committing an action matter, making agency an important aspect of this framework.

A virtue is an excellent character trait (Hursthouse & Pettigrove, 2016a). Motives, moral character, and questions such as, 'what kind of person do I want to be?' and, 'how should I

live?' are aspects addressed by virtue ethics that tend not to be found in a utilitarian or deontological framework (Devettere, 2002; van Hooft, 2006). Virtue ethics answers the question of how we should live and why we should live that way. For example, utilitarianism assesses the permissibility of an action by weighing the positive and negative consequences of said action against the consequences of alternative actions; this can be done without attention to the agent. Virtue ethics does consider the intentions and motives behind an agent's action when determining the virtuosity of the action because action and agent are mutually considered. It is therefore not sufficient to perform a virtuous act if one does not perform it virtuously (Aristotle, 340BC; Crisp, 2010). To do this, the moral agent must commit the appropriate action, at the appropriate time, for appropriate reasons, and under appropriate circumstances. Virtuous people commit compassionate acts not because they know them to be virtuous, for example, but because they are concerned about and want to alleviate the suffering of others (Crisp, 2010). This character is acquired and sharpened over time in the moral agent's relationships with others, often making community an important aspect of a virtue ethics approach (Carden, 2006).

Moreover, a virtue ethics framework highlights the concept of narratives. While it is not critical to virtue ethic ideas, narratives adopt well into and often elevate a virtue ethics perspective. For example, the process of virtue cultivation can lie within a greater storyline or narrative. The progression of the moral agent's life reveals many acts and intentions over a lifetime—from this birds-eye view, one can more accurately determine the individual's character and the trajectory of that development. A solitary act is one coordinate on the plane of the moral agent's life and may not portray their virtues or character traits accurately—one would not understand the general disposition of the moral agent, but rather a far less meaningful

isolated act (McMylor, 1994; Treanor, 2014). Committing one virtuous act does not make someone virtuous, it takes habit to do that. Understanding how time and circumstance play a part in this is to accept the narrative concept into virtue ethics.

Virtue ethics traditionally considers the character of individuals, but the move to nations is made for a several reasons. Conversations are typically had between individuals, but countries can similarly "talk" about their reputations and converse with other nations. Some believe that countries have de facto character traits, constituting the aggregate or average of characteristics of individuals in any given nation (Kohn, 2005; Peabody, 1985). Regardless of whether countries have virtues and maintain reputations or not, it is sufficient that we talk as if they do to carry out a virtue ethics analysis. If the structure is there, it can be analyzed as such.

1.3 Overview

The remainder of this paper covers the background and history of the Kyoto Protocol and Paris Agreement in *Section 2: Background*. In *Section 3: Ethical Structures and the Move to Virtue Ethics,* I examine the ethical structures of the Kyoto Protocol and Paris Agreement. In *Section 4: C40 Cities Climate Leadership Group,* I look into a worldwide organization that addresses urban mitigation policies while utilizing virtue ethic ideas. This section illustrates how the use of virtue ethics in the Paris Agreement is not an isolated occurrence. The paper concludes with *Section 5: Conclusion and Future Research*, where I make final comments and offer directions for future research.

2. Background

2.1 The Kyoto Protocol

The Kyoto Protocol was adopted on December 11, 1997 in Kyoto, Japan and entered into force on February 16, 2005 (International Institute for Sustainable Development, 2009). It

sets emission reduction targets for the European community and 37 other countries. If these targets were met, it would have constituted a 5% reduction in carbon emissions compared to 1990 emission levels by the year 2012, which also signaled the end of the first commitment period which started in 2008. The Doha Amendment was adopted to the Protocol in 2012 and set up the second commitment period—this period will last until 2020. Emission reduction targets during this period are set to be 18% below 1990 emission levels (UNFCCC, 2014). Following the ideal of common but differentiated responsibilities, the Kyoto Protocol commits only developed countries to this target, as they maintain the monetary means and satisfactory socio-economic development to mitigate carbon. Since developing nations have not yet reached this level of development and often cannot mitigate carbon sustainably, they are encouraged to first focus on poverty eradication and socioeconomic development. The ideals of common but differentiated responsibilities are founded on the improvement and protection of human welfare; while all nations are called to do this, they are defined in different ways[49] (UNFCCC, 1992).

[49] The UNFCCC believes that effective responses to climate change are those actions that support sustainable development and economic growth. A key feature of sustainable development lies in the consideration of future generations and in meeting current people's basic needs and offering opportunities for a better life. Those in poverty are susceptible to ecological and other catastrophes (World Commission on Environment and Development, 1987). Developed nations are to support the adoption of programs and policies that create opportunity for the transfer of green technologies to developing countries under the concept of capacity building found in the UNFCCC (UNFCCC, 1992, 1998). There are three main mechanisms by which countries can curb emissions under the Kyoto Protocol: International Emissions Trading, Joint Implementation, and the Clean Development Mechanism. Under International Emissions Trading, each country under a target can trade unused emission units to countries unable to meet their goal; this has created the carbon market (UNFCCC, 2014). Countries can meet their goals by investing in mitigation projects in developing countries; developed countries not only gain carbon credits for these ventures, but also help developing countries transition to sustainable technology—this is the Clean Development Mechanism. Joint Implementation allows countries to meet their targets by investing in emission removal or reduction projects in other nations that have ratified the treaty; one nation helps another sustainably develop while simultaneously gaining emission reduction units for itself (UNFCCC, 2014).

2.2 The Paris Agreement

The Paris Agreement was adopted on December 12, 2015 in Paris, France at the United Nations Climate Conference. It was ratified on October 5, 2016 after 55 Parties, accounting for at least 55% of total greenhouse gas emissions, signed it; China and the United States signed on the first day (Lewis, 2016). Entering into force on November 4, 2016, presently 185 of 197 nations have ratified it (UNFCCC, 2015). Building upon the goals of the UNFCCC and the Kyoto Protocol, it aims to hold global average temperature increases to no more than 2°C above pre-industrial levels, with hopes to restrict it to no more than a 1.5°C increase—a threshold that would significantly reduce climate change risks and impacts (UNFCCC, 2015). Noting that almost 1°C of warming has already occurred, the Paris Agreement highlights adaptation as an immediate and imperative aspect of the climate change response; this includes building up adaptive capacity (such as preparing cities for more intense storm surges and increased sea levels), reducing vulnerability, and enhancing climate change resilience. It also includes taking advantage of beneficial changes that will arise because of climate change, such as increased crop yields and longer growing seasons in certain areas (UNFCCC, 2015).

The Paris Agreement uses NDCs to structure carbon mitigation—these are voluntary climate action plans to be submitted by each country. The Paris Agreement encourages aggressive contributions that reflect each nation's ambition as well as current circumstances and capabilities (UNFCCC, 2015). Beginning in 2023, countries are to undergo a global stocktake which assesses the performance of the Agreement and keeps countries accountable for achieving and strengthening NDCs. These global stocktakes are administered every five years.

3. Ethical Structures and the Move to Virtue Ethics

In the following, I argue that the Paris Agreement appeals to national character and reputation in the pursuit of voluntary contributions. With an ethical structure that is reflective of virtue ethics, the Paris Agreement supports a global community of cooperation by asking for contributions from both developed and developing nations. By structuring policy with recurring voluntary pledges, it encourages nations to take personal responsibility for their contributions. Although targets are considerably relaxed in their status to voluntary, there remains an opportunity for greater long-term participation because of this structure (Brun, 2016; Chan, 2016). For instance, it gives hope that countries with initially insufficient contributions will strengthen these contributions as infrastructure and national policies evolve (J. F. Green, 2015). In this way, the Paris Agreement uses NDCs to push for more carbon mitigation in the long-term than the Kyoto Protocol. For these reasons, the bottom-up approach of the Paris Agreement is a more appropriate option for nations wanting to mitigate but not able to commit to the 5% emission decrease prescribed by the Kyoto Protocol.

3.1 Reputation and Character in Nationally Determined Contributions

Whereas success in the Kyoto Protocol was predetermined to be a 5% decrease in emissions compared to 1990 emission levels, the Paris Agreement allows nations to individually define success by determining for themselves what their contributions will be. This change turns a previously top-down approach into a more palatable bottom-up approach and

gives certain behavioral freedoms back to nations.[50] Permitting nations to determine contribution targets also lets them take ownership of those decisions.[51]

Countries can consider several factors when deciding what their contributions will be such as how much each country can afford to mitigate, how well mitigation integrates into existing infrastructure, or how each country wants to represent itself to the rest of the world. The weight of these factors depends on each country's values, which in turn might be affected by outside circumstances and internal national traits. Considerations of what character each country possesses and how each nation's international reputation will be shaped could also influence this decision. For instance, 'How should each country act?' or 'What kind of nation does each country aspire to be?' are questions to consider.

Reputational pressures have been shown to factor into agreement compliance and oftentimes, international agreement compliance (Chayes & Chayes, 1995; Goldsmith & Posner, 2005; Guzman, 2006; Henkin, 1979; Young, 1992). If countries act from reputational pressures or care how others perceive them, they would have a vested interest in maintaining an acceptable reputation. Nations with a strong sense of honor, prestige, or leadership, for example, are likely to follow laws in order to maintain satisfactory perceptions of virtue and reputability (Henkin, 1979). The character developed due to involvement with carbon mitigation would

[50] The character of a nation can be thought of as the aggregate character traits of the individuals of that nation. Similarly, national governments are comprised of individuals who are acting, reacting and making decisions based on outside stimuli and influence (Kohn, 2005; Peabody, 1985).

[51] This can be partially explained by psychological reactance: individuals respond negatively when their freedom of options is limited or autonomy is impinged (Brehm, 1966; Steindl, Jonas, Sittenthaler, Traut-Mattausch, & Greenberg, 2015). People's willingness to contribute increases when they are included in the decision-making process. The absence of this is why messages sometimes fail to be persuasive to target audiences (Quick, 2014). In addition to message content, message frame and delivery influence how someone reacts to a message, and the change in ethical structure from the Kyoto Protocol to the Paris Agreement changes the message frame to one that supports nations' involvement in the decision-making process.

reflect each country's circumstances and position on climate change—this in turn will affect each country's reputation.

The successive nature of pledges also promotes virtuous behavior because these pledges exist in a narrative-like, rather than static setting. The narrative that is created by progressing towards increasingly aggressive contributions tells a more complete story of a country's intent than does a solitary pledge (McMylor, 1994). The continual strive towards a goal gives greater depth and meaning to carbon mitigation and is a procedure by which countries can strengthen their intentions. This structure additionally allows for each country's character to precipitate out more evidently and an international reputation to solidify. Contributions over time show a trend towards "the good:" that is, the most aggressive contribution a country can offer. Similarly, it is not one solitary act but the collection of acts over one's lifetime that makes for a virtuous person. Character traits and virtues alike are developed over time; therefore one virtuous act does not immediately or automatically make a person virtuous.

Although the Kyoto Protocol intended to prescribe appropriate national targets, many of these targets were not met. The number of nations that defaulted on their commitments under the Kyoto Protocol created a condition in which no country tarnished its reputation over another. Reputation failed to be a strong influence for compliance because the requirements were too stringent, and a large subsection of countries would fail to meet them. For example, Canada pulled out of the Kyoto Protocol because it knew it would fail to meet its targets. It eventually set more manageable targets at 17% below 2005 levels—a target comparably aggressive to the United States' at the time (Paris, 2012). Canada looked to other countries to determine a more appropriate goal and then adopted a similarly aggressive one. By doing this, Canada's target or progress could not be criticized over or above the United States.' Targets are

not binding, therefore not very useful if countries cannot attain them. Rather, countries default to a system more representative of virtue ethics as they look to other nations for guidance and examples. The Paris Agreement avoids this problem because it does not prescribe mandatory targets, so nations do not leave the Agreement or fail to meet targets due to a lofty benchmark. Nations can avoid being stigmatized by mitigating together and progressing as they are able.

Next, I show how the global pledge network encourages countries to submit increasingly aggressive contributions by promoting mutual support between countries, transparency in contributions, and accessible communication streams. The pledge network further reinforces the appeal to reputation and introduces the concept of community.

3.2 The Global Pledge Network: Keeping Countries Accountable

Once contributions are determined, nations must submit their intentions to a global pledge network, effectively making their intentions public knowledge. This evokes a kind of global peer pressure that nations can interpret in various ways: they might look to others with a competitive eye, a concern of gaining an unfavorable reputation or alternatively, a drive to cultivate a good one. Either way, this network is structured to support the maintenance of a favorable reputation, and this concern of reputational loss or gain can be leveraged to incentivize participation and ambition[52] (Ad Hoc Working Group on the Durban Platform for Enhanced Action, 2014). The Paris Agreement's success will depend on how ambitious countries will be in setting and meeting emission reductions and how concerned they are with increasing their reputational revenue (Schleussner et al., 2016). Because successive NDCs should become increasingly aggressive after each global stocktake, this structure enforces the continual improvement of mitigation behavior. This gradual improvement and attainment of

[52] This can occur even when there is no threat of national sanctioning (Hayden, 2011; Nye, 1990, 2011; Young, 1992).

virtue and an increasingly aggressive NDC take time (Kotva Jr., 1996). The pinnacle of virtue is not attained in one act; the Paris Agreement reflects this ideal as it does not demand the most aggressive NDC upon first pursuance.

According to virtue ethics, community plays a vital role in perpetuating and maintaining ethical behavior. Our virtues and intuitions are acquired and built upon our relationships with others, and through these relationships our communities are formed (Carden, 2006; van Hooft, 2006). Virtuous behavior is acquired then, through a kind of ethical feedback loop. For example, some nations will be leaders, offering extremely aggressive mitigation targets; others will be followers, hoping only to catch up and not take a reputational hit. Leaders help instill virtuous behavior because they can showcase the aggressive targets that others are in pursuance of. Standards of virtuous behavior are perpetuated through the pledge network in this way (Carden, 2006; van Hooft, 2006). While a national community can hardly be considered a local community except possibly on large scales, there is no conclusive reason why the same should not apply to a larger group of entities that can communicate and respond to reputational pressures.

3.3 Developed and Developing Nations Alike

Under the Kyoto Protocol developed nations were expected to meet their targets and financially and technologically support developing nations; developing nations were not held to measurable targets. This requirement is based on the principle of common but differentiated responsibilities. Further, these obligations came under opposition by the United States because China and India were both substantial carbon emitters yet retained their classification as developing nations. Because of this, China and India were not bound to targets. While the United States would have had to initially slow its economy (Mistrick, 2013; Paris, 2012), China

could continue to grow theirs, unhindered by carbon controls. This top-down approach began to alienate nations from one another. For example the United States did not want to participate in a cooperative global effort that did not seem fully cooperative (Bush, 2001). From a utilitarian perspective, it is difficult to reason why a country should carry the brunt of the international effort when participation of all major emitters is needed to maximize the overall utility of mitigation. The Kyoto Protocol unintentionally undermines this goal, especially as it is structured using rule utilitarian appeals.

The international mitigation effort is made greater and more whole because the Paris Agreement requests NDCs from both developed and developing nations. By positioning mitigation as the collective responsibility of all nations, the Paris Agreement supports a unified mitigation regime which in the long term could be critical to its success (Kintisch, 2015; Upton, 2016; Urpelainen, 2015). This regime is supported through the Green Climate Fund (GCF) which creates more balanced opportunities between developed and developing nations by unlocking resources for mitigation and adaptation projects in developing nations. Under the Paris Agreement developing nations including China and India have pledged to limit their emissions (Kintisch, 2015).

In summary, I have argued that an important difference between the Kyoto Protocol and the Paris Agreement can be found in their ethical structures. Whereas the Kyoto Protocol appeals to rule utilitarian ideas, creating a top-down approach to carbon mitigation, the Paris Agreement appeals to virtue ethics, establishing a bottom-up approach. Although both maintain the same overall objective, the choice of ethical appeals changes each policy's structure and therefore can potentially alter their adoptability. The Paris Agreement supports the improvement of contributions by leveraging reputational losses and gains. By doing this, it

positions itself to be more inclusive than the Kyoto Protocol. Countries can begin developing national carbon mitigation policies and continually strengthen their pledges as they are able.

Next, I describe a case in which urban centers apply virtue ethics concepts for the advancement of carbon mitigation policy. This examination of smaller-scale policy illustrates a further application of virtue ethics beyond its application in the Paris Agreement.

4. C40 Cities Climate Leadership Group

4.1 Introduction to C40 Cities

Cities account for over 70% of energy-related carbon dioxide emissions and have one of the greatest potentials for economical emission reductions—this makes them a smart channel through which to promote mitigation policy (Rudolph & Morotomi, 2016). C40 Cities Climate Leadership Group (C40 Cities) demonstrates how smaller-scale mitigation efforts fitting with the bottom-up approach can advance mitigation policy via virtue ethics pathways.

C40 Cities is a conglomeration of several of the world's largest megacities[53] with the goal of implementing policies to reduce greenhouse gas emissions and climate risks (C40 Cities Climate Leadership Group, 2017a). Founded on the idea that collaboration helps cities progress faster, C40 Cities has adopted the Paris Agreement's goal of avoiding a 2°C increase in global average temperatures (C40 Cities Climate Leadership Group, 2017b). Ken Livingstone, mayor of London at the time, created C40 Cities in 2005 by calling an assembly of representatives from 18 of the world's cities to create a cooperative plan to combat climate change. In 2006, Livingstone partnered with the Clinton Climate Initiative,[54] which mutually strengthened both organizations. By this time, 40 cities were part of the network and the organization was named

[53] Megacities are typically considered to be those with more than 10 million people in them.
[54] The Clinton Climate Initiative is a subsection of the Clinton foundation that aims to mitigate climate change by developing scalable projects that can simultaneously be implemented at the local level ("Clinton Climate Initiative," 2017).

C40 Cities. Currently, over 80 megacities are a part of C40 Cities, representing over 600 million people and a combined global GDP of 25% (C40 Cities Climate Leadership Group, 2016a). In 2001, C40 Cities partnered with the World Bank and Local Governments for Sustainability, which serves to accelerate emission initiatives, allow for better financing, and encourage transparent accounting and progress reporting.

4.2 The Structuring of C40 Cities

C40 Cities has a reporting platform similar to that of the Paris Agreement. Articles 13 and 14 of the Paris Agreement call for a supportive transparency framework that builds mutual trust between nations and a global stocktake to assess nations' progress (UNFCCC, 2015). Similarly, C40 Cities knows accountability facilitates open communication between cities and is therefore necessary for its success (C40 Cities Climate Leadership Group, 2016b). As stated previously in *The Global Pledge Network: Keeping Countries Accountable,* a transparent pledge network incites a positive peer pressure on entities (in this case cities) to maintain a favorable reputation. The community plays a vital role in perpetuating and maintaining ethical behavior—one city's ambition will likely influence other cities' ambitions.

C40 Cities fosters a global community united under a common purpose, and this mutual encouragement mirrors virtue ethics concepts: virtues and good habits are cultivated with the support and in relationships of others (C40 Cities Climate Leadership Group, 2016b; Carden, 2006). Not only is the virtue of mitigation strengthened among C40 Cities. Actual technologies, measurable outcomes, sustainable infrastructures, and green policies are also strengthened because cities work together and share resources as an international community. Being in this common relationship and striving for a unified goal is a source of C40 Cities strength, enabling cities to adopt climate policies at a quicker pace than if they attempted to do so independently

(C40 Cities Climate Leadership Group, 2016a). Encouraging dialogue that instills trust between its cities, C40 Cities ensures that ideas, solutions, lessons, questions, and friendly competition flow freely between its member cities (C40 Cities Climate Leadership Group, 2016b).

Cities are an exemplary level of organization by which to implement climate initiatives. Cities tend to have similar political leanings and can therefore, with agreement in thought and action, efficiently push policy through the appropriate governmental channels (C40 Cities Climate Leadership Group, 2014; Cain Miller, 2016). The ability to aggressively pursue mitigation policy reform is strengthened by C40 Cities encouragement of such behavior. A virtue ethics framework enables C40 Cities to achieve this goal because the cultivation of these behaviors are a result of interactions and relationships between the greater community of cities (Carden, 2006). City leaders can be bold in their goals and actions because they are supported by this network (Hidalgo, Paes, & Angel Mancera, 2016).

Because of its reporting platform, its inclusive goals and support systems, and its grassroots policy implementation, C40 Cities instills and strengthens common virtue between its member cities. This allows for progressive carbon mitigation policy. Virtue ethics is an important aspect of a bottom-up approach as communities work together at the local level to advance climate policy.

5. Conclusion and Future Research

The Paris Agreement avoids many of the issues that are characteristic of the Kyoto Protocol. It encourages developed and developing nations to contribute to carbon mitigation by removing selectively mandated targets and replacing them with NDCs; this provides for a credible global mitigation regime. Public pledges foster mutual support and cooperation

between nations and also structure in a positive pressure on nations to exemplify good character traits in the pursuit of gaining or maintaining favorable international reputations.

What makes a character trait a virtue is its conduciveness to realizing and promoting certain desirable ends (Sandler, 2007). It is a virtue then, to put forth aggressive NDCs because carbon mitigation helps realize the desirable end of curbing carbon emissions. Virtues are strengthened when they are practiced. Nations exemplify this when they submit consecutive NDCs, strengthening their pledges at each stocktake and forming a favorable reputation and a more meaningful narrative in the process. The examination of C40 Cities Climate Leadership Group shows how virtue ethics concepts incorporate into decision-making and policy creation at the local and global level. Future research should include a meta-analysis of policy structuring to determine if specific trends precipitate out among policies and what outcomes might arise from such structuring. Once policies are implemented, more quantitative observations can be attained and compared to theoretical predictions.

The use of different ethical appeals changes the ethical structure of policy and the ways in which policy can be adopted and potentially implemented. Analyzing the ethical structures within policy can aid in this estimation. Here I offered an original addition to policy analysis by explaining a new perspective on how ethics can help shape and set the tone of policy. Using ethics in this way presents an overlooked yet potentially significant tool for policy analysis. Further, ethics could influence how various policies can be adopted and implemented in measurably predictable ways.

Conclusion

Overall, this dissertation illustrated how philosophy—specifically ethics—has a place in policy analysis, best communication practices, and public opinions about climate change. The fact that philosophy can alter policy, communication, and opinions, means that future research is warranted to understand what philosophy's effects might be, whether intended or unintended. Here I provide a brief summary of each chapter and main points.

Climate change is a reality that we all live with, but the way in which people perceive climate change can depend on several variables. One of these variables includes how we frame ethical messages. This dissertation showed that people think about and apply ethics in various ways. Some people think in deontological ways, others think in utilitarian or virtue ethic ways (or even possibly a combination thereof). While these preferences might be arbitrary or hard to predict for some, for others, group identity helps mold how individuals ethically assess situations in predictable ways.

A substantial body of theoretical background shows that the religious are more likely to assess ethical situations in deontological ways, whereas less religious people are likely to assess ethical situations using utilitarian ideals. Chapter one and two demonstrate how this holds true when an individual is perceiving their potential ethical obligation to address the effects of climate change. These chapters illustrated how communication practices can be improved upon by incorporating values and preferences of the groups with which we intend to communicate. Doing so can increase relatability of messages and therefore, increase the persuasiveness of the communication we intend to impart to these audiences.

Main Points from Chapter 1 and 2:

- The more religious someone is, the more likely they are to agree with a deontologically framed moral obligation to address climate change (but not a utilitarian or virtue ethics framed obligation).
- The more religious someone is, the more likely they are to find the deontologically framed reason to reduce the effects of climate change more persuasive than the utilitarian framed reason (the less religious someone is, the more likely they are to think the utilitarian framed reason is more persuasive than the deontologically framed reason).
- The younger someone is, the more likely they are to agree with the virtue ethics framed moral obligation to reduce the effects of climate change (but not the deontologically or utilitarian framed message).
- The younger someone is, the more likely they are to find the virtue ethics reason more persuasive than the utilitarian and deontological reason to reduce the effects of climate change.

Perceptions of climate change as an ethical issue are more nuanced and complex than they seem. This gives good reason to continue researching the ethical aspects of climate change. In chapter three, I wanted to determine which aspects of climate change are identified as ethical by the American public, and in what ways are they seen as such. I find that it is possible to think some aspects of climate change are ethical while others are not. For instance, more people agree with the statement, "When people think about what should be done about climate change, they are engaging in moral decision-making" (*decision-making* statement) than the statement, "My beliefs on whether climate change is real or not are a reflection of my morals or ethics" (*beliefs* statement). Results also demonstrated that some people can think climate change is a moral

belief without thinking climate change is human-caused or a serious problem. Based on this finding, it is clear that these respondents are interpreting 'ethics' differently than the majority or that they identify the "correct" ethical belief as being something other than believing climate change to be human-caused. Understanding how climate change can be perceived as an ethical issue among various groups and *how* it is perceived as ethical will be very important knowledge when trying to communicate and connect with those who do not have completely pro-climate change attitudes.

Main Points from Chapter 3:

- More people agree with the *decision-making* statement than the *beliefs* statement.
- Certain respondents "strongly agree" that their beliefs about climate change are moral beliefs, but "strongly disagree" that decisions made to address climate change are exercises in moral decision-making. Most people who fall into this category are non-Hispanic white conservative Republican males who think climate change is not human-caused nor a serious problem.
- Religiosity positively correlates with agreement to the *beliefs* statement.
- Increasing liberalism positively correlates with agreement to the *decision-making* statement.

In chapter four, I showed that the Kyoto Protocol and the Paris Agreement are international climate treaties that structure how carbon mitigation is to be carried out. The structures of these treaties rely heavily on different ethical frameworks. I call the use of ethical frameworks to structure *how* something is to be done, the ethical structure (this structure affects the organization of written policy and how it can be adopted and implemented). I created this concept to emphasize how necessary it is to be aware of the ethical frameworks that are being

appealed to in the formulation of policy. While the Paris Agreement has not gone into full effect yet, making it difficult to compare effectiveness between the Paris Agreement and the Kyoto Protocol, it is necessary to understand the range of potential effects of using different ethical frameworks to structure policy. Future research might include understanding the policymaking process and whether ethical frameworks could or do play a part in it.

Main Points from Chapter 4:

- The Kyoto Protocol uses rule utilitarianism ideas to structure carbon mitigation whereas the Paris Agreement uses virtue ethics and an appeal to each nation's reputational concern. While the Paris Agreement calls for less aggressive contributions initially, there is hope that this structure will inspire long term participation and continual improvement among contributions.

Overall, this discussion showed that if we can determine which ethical frameworks people use to understand and assess moral situations, we can use these findings to frame issues to make them more understandable, relatable, agreeable, and persuasive. The appropriate ethical framework should be able to reach people more effectively. Philosophy might be considered an afterthought when trying to create change in both policy, communication science, and the climate change arena, but this dissertation showed that this is far from the case. Philosophy has a necessary place at the table when solving the multifaceted issues climate change presents.

In the future, I would like to continue my research using the Toolbox Dialogue Initiative[55] (TDI) methods to determine if and how ethics plays a role in the policymaking process. Originally created to discuss research assumptions across disciplines, I ran these

[55] For more information on the Toolbox Dialogue Initiative, see http://tdi.msu.edu/workshops/.

workshops to understand how cross-disciplinary collaboration affects policymaker's understanding of ethics' use in policymaking and how ethics can facilitate the policymaking process. I have already conducted preliminary research using TDI methods, but this research did not make it into this dissertation. I additionally want to explore the connection between age and the preference for a virtue ethics appeal. It is unknown how strong this virtue ethic effect is, or how an individual's community or social media presence might influence this effect. Younger generations who are overrepresented on social media might feel an amplified pressure to maintain an acceptable image in front of their peers. I want to see what the ramifications of this might be for climate change attitudes and behaviors.

If younger generations are more susceptible to virtue ethic ideas, then with whom they interact in person and on social media could have a measurable effect on how much they are willing to accept climate change ideas and advocacy efforts. Individuals who spend more time on social media could have a stronger urge to portray and upkeep a particular image over those who do not spend a comparable amount of time on social media. Individuals on social media might be exposed to more opinions or become aware of information more quickly. Those with likeminded friends and communities might be more willing to partake in advocacy efforts. I want to test how virtue ethics is adopted and sustained in this social media environment and how the effect of social media will mediate a preference for virtue ethics, especially among younger generations.

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Appendix 1. Control Variables of Chapter 1

The variable *"When people think about what should be done about climate change, they are engaging in moral decision-making"* is used as a control. If respondents agree with all ethical framework statements (in this case, it only occurs for the ideology variable), which are based on specific ethical frameworks, then they should also agree with the statement, "When people think about what should be done about climate change, they are engaging in moral decision-making." If a respondent is willing to agree with all *specific* ethical framework statements, then s/he should also agree with a more generalized or *broad* version of those ethical statements. E.g.: if a respondent agrees that the specific ethical appeals relate to climate change, s/he should agree that ethics more generally apply to climate change as well. If s/he do not, this might mean that s/he is not associating the ethical framework statements as ethical statements at all. Because, "When people think about what should be done about climate change, they are engaging in moral decision-making" is a broad version of the three specific ethical framework statements, it acts as a control to check that those who agree with the *character, harm,* and *duty* statements should be positively correlated with this control statement (Table A). Also, ideology (more liberal) should be positively correlated with the control statement (Table B). Analysis shows that both assumptions are supported.

Table A.

	When people think about what should be done about climate change, they are engaging in moral decision-making		
	B	p-value	Standard Error
Constant	1.235	**0.001**	0.104
R^2	0.355	**--**	0.930
Character	0.318	**0.001**	0.034
Harm	0.167	**0.001**	0.036
Duty	0.184	**0.001**	0.039

Table B.

	When people think about what should be done about climate change, they are engaging in moral decision-making		
	B	p-value	Standard Error
Constant	2.696	**0.001**	0.081
R^2	0.126	**--**	1.083
Ideology	0.244	**0.001**	0.019

Appendix 2. Tests of Robustness for Chapter 1

Several tests of robustness were performed to verify results found:

	Harm		**Duty**		**Character**	
	B (st. error)	p-value	B (st. error)	p-value	B (st. error)	p-value
Constant	2.452 (0.300)	0.001	2.268 (0.278)	0.001	2.732 (0.317)	0.000
Gender	0.182 (0.059)	0.002	0.144 (0.054)	0.008	0.025 (0.062)	0.689
Age	-0.004 (0.002)	0.045	-0.002 (0.002)	0.299	-0.008 (0.002)	0.001
Ideology	0.351 (0.019)	0.001	0.312 (0.018)	0.001	0.322 (0.020)	0.000
Income	-0.004 (0.009)	0.708	-0.002 (0.009)	0.794	-0.014 (0.010)	0.175
Education	0.035 (0.019)	0.069	0.021 (0.018)	0.242	0.031 (0.020)	0.120
Non-white dummy	-0.001 (0.082)	0.992	0.145 (0.076)	0.055	0.024 (0.086)	0.785
Hispanic	-0.223 (0.108)	0.040	-0.139 (0.100)	0.165	-0.275 (0.115)	0.017
Religiosity	0.036 (0.037)	0.330	0.097 (0.034)	0.004	0.068 (0.038)	0.078
Non-religious dummy	0.127 (0.152)	0.089	-0.125 (0.082)	0.128	0.120 (0.093)	0.200
R^2	0.297 (0.985)	--	0.265 (0.910)	--	0.241 (1.036)	--
Number of observations	1202		1202		1202	

	Harm		**Duty**		**Character**	
	B (st. error)	p-value	B (st. error)	p-value	B (st. error)	p-value
Constant	1.852 (0.409)	0.001	2.381 (0.385)	0.001	2.732 (0.439)	0.001
Political party	0.403 (0.122)	0.001	0.360 (0.115)	0.002	0.380 (0.130)	0.004
Gender	0.244 (0.077)	0.002	0.106 (0.072)	0.142	0.004 (0.082)	0.958
Age	-0.003 (0.003)	0.350	-0.003 (0.003)	0.262	-0.009 (0.003)	0.004
Ideology	0.276 (0.033)	0.001	0.238 (0.031)	0.001	0.232 (0.035)	0.001
Income	-0.014 (0.013)	0.286	-0.007 (0.012)	0.580	-0.017 (0.014)	0.214
Education	0.067 (0.025)	0.007	0.032 (0.023)	0.171	0.068 (0.027)	0.010
Black dummy	-0.112 (0.158)	0.479	0.156 (0.149)	0.295	-0.053 (0.169)	0.753
Asian dummy	0.197 (0.159)	0.214	0.246 (0.149)	0.100	0.059 (0.170)	0.727
Other, mixed dummy	-0.084 (0.292)	0.772	-0.181 (0.275)	0.511	-0.107 (0.312)	0.732
Hispanic	-0.183 (0.155)	0.239	-0.234 (0.146)	0.110	-0.331 (0.167)	0.048
Religiosity	0.038 (0.051)	0.458	0.115 (0.048)	0.016	0.053 (0.054)	0.327
Evangelical dummy	-0.036 (0.160)	0.824	-0.089 (0.150)	0.552	-0.153 (0.170)	0.371
Christian non-Evangelical dummy	-0.030 (0.126)	0.812	-0.123 (0.119)	0.301	-0.145 (0.135)	0.283
Religious non-Christian dummy	-0.079 (0.173)	0.647	-0.260 (0.162)	0.110	-0.064 (0.184)	0.727
R^2	0.378 (0.977)	--	0.320 (0.920)	--	0.301 (1.044)	--
Number of observations	1202		1202		1202	

Appendix 3. Pearson Correlations of Independent Variables of Chapter 1

Top number is Pearson correlation, bottom number in parentheses is the p-value.

	Religiosity	Income	Education	Hispanic	Age	Gender	White dummy	Evangelical dummy	Perceived seriousness	Human caused dummy
Ideology	-0.400 (0.001)	-0.046 (0.112)	0.067 (0.021)	-0.049 (0.087)	-0.168 (0.001)	0.118 (0.001)	-0.154 (0.001)	-0.344 (0.001)	0.561 (0.001)	0.486 (0.001)
Religiosity	--	-0.030 (0.293)	-0.042 (0.143)	-0.013 (0.647)	0.120 (0.001)	0.073 (0.011)	-0.048 (0.094)	0.486 (0.001)	-0.220 (0.001)	-0.215 (0.001)
Income	--	--	0.420 (0.001)	0.002 (0.936)	0.109 (0.001)	-0.095 (0.001)	0.014 (0.623)	-0.082 (0.004)	-0.037 (0.199)	-0.015 (0.602)
Education	--	--	--	0.028 (0.333)	0.089 (0.002)	-0.058 (0.046)	-0.038 (0.184)	-0.076 (0.008)	0.028 (0.339)	0.074 (0.011)
Hispanic	--	--	--	--	0.161 (0.001)	-0.016 (0.581)	0.123 (0.001)	0.031 (0.281)	-0.119 (0.001)	-0.087 (0.003)
Age	--	--	--	--	--	-0.109 (0.001)	0.113 (0.001)	0.050 (0.083)	-0.179 (0.001)	-0.181 (0.001)
Gender	--	--	--	--	--	--	0.048 (0.095)	0.019 (0.516)	0.164 (0.001)	0.089 (0.002)
White dummy	--	--	--	--	--	--	--	-0.007 (0.798)	-0.158 (0.001)	-0.130 (0.001)
Evangelical dummy	--	--	--	--	--	--	--	--	-0.227 (0.001)	-0.176 (0.001)
Perceived seriousness of CC	--	--	--	--	--	--	--	--	--	0.704 (0.001)
Human caused dummy	--	--	--	--	--	--	--	--	--	--

Appendix 4. Pearson Correlations of Dependent Variables of Chapter 1

Top number is Pearson correlation, bottom number in parentheses is the p-value.

	Harm	Duty	Character
Harm	--	0.719 (0.001)	0.704 (0.001)
Duty	--	--	0.681 (0.001)
Character	--	--	--

Appendix 5. Nationally Representative Survey Data

Current Census Data (Population) Versus Survey Sample, provided by Survey Sampling International.

	Survey Sample	Population
Gender		
Male	49%	49%
Female	51%	51%
Age		
18-24	16%	16%
25-34	16%	18%
35-44	18%	18%
45-54	18%	19%
55-64	16%	16%
65+	16%	17%
Ethnicity		
Caucasian	65%	64%
African American	15%	16%
Hispanic	13%	12%
Asian	4%	5%
Other	3%	3%
Education		
High School or Less	29%	32%
Some College	20%	19%
College Graduate	33%	31%
Some Post Grad	6%	6%
Post Grad/Doctoral	12%	12%
Household Income		
Less than $20k	20%	20%
$20-$30k	12%	12%
$30-$40k	10%	10%
$40-$50k	9%	9%
$50-$60k	10%	8%
$60-$75k	12%	10%
$75-$100k	11%	11%
$100-$150k	10%	12%
$150k+	6%	8%
Census Region		
Northeast	18%	18%
Midwest	20%	22%
South	38%	36%
West	24%	24%

Appendix 6. Tests of Robustness for Chapter 2

Several tests of robustness were performed to verify results found:

Reference Category: Harm		**B**	**p-value**
Character	Intercept	0.768 (0.717)	0.285
	Age	-0.023 (0.007)	0.001
	Gender	0.110 (0.185)	0.554
	How serious a problem is climate change?	-0.579 (0.114)	0.001
	Ideology	0.040 (0.071)	0.576
	Religiosity	0.123 (0.096)	0.201
	Education	-0.095 (0.059)	0.110
	Hispanic Heritage	0.432 (0.317)	0.173
	Non-white dummy	0.322 (0.285)	0.258
	Evangelical dummy	0.049 (0.243)	0.838
Duty	Intercept	-0.039 (0.574)	0.946
	Age	0.004 (0.005)	0.506
	Gender	-0.097 (0.148)	0.513
	How serious a problem is climate change?	-0.303 (0.094)	0.001
	Ideology	0.001 (0.056)	1.000
	Religiosity	0.246 (0.077)	0.001
	Education	-0.057 (0.048)	0.233
	Hispanic Heritage	0.131 (0.277)	0.637
	Non-white dummy	-0.334 (0.196)	0.088
	Evangelical dummy	-0.044 (0.189)	0.814
Reference Category: Duty		**B**	**p-value**
Character	Intercept	0.807 (0.786)	0.305
	Age	-0.027 (0.125)	0.001
	Gender	0.207 (0.206)	0.315
	How serious a problem is climate change?	-0.276 (0.125)	0.027
	Ideology	0.040 (0.079)	0.614
	Religiosity	-0.123 (0.108)	0.253
	Education	-0.038 (0.066)	0.564
	Hispanic Heritage	0.301 (0.359)	0.402
	Non-white dummy	0.656 (0.305)	0.032
	Evangelical dummy	0.094 (0.261)	0.718

Reference Category: Harm		**B**	**p-value**
Character	Intercept	1.059 (0.651)	0.104
	Age	-0.024 (0.007)	0.001
	Gender	0.117 (0.183)	0.523
	How serious a problem is climate change?	-0.546 (0.097)	0.001
	Religiosity	0.105 (0.082)	0.200
	Education	-0.072 (0.054)	0.178
	Non-white dummy	0.287 (0.281)	0.306
Duty	Intercept	-0.093 (0.527)	0.860
	Age	0.003 (0.005)	0.546
	Gender	-0.098 (0.147)	0.506
	How serious a problem is climate change?	-0.313 (0.081)	0.001
	Religiosity	0.262 (0.067)	0.001
	Education	-0.055 (0.043)	0.196
	Non-white dummy	0.287 (0.281)	0.306
Reference Category: Duty		**B**	**p-value**
Character	Intercept	1.152 (0.716)	0.107
	Age	-0.027 (0.008)	0.001
	Gender	0.215 (0.204)	0.291
	How serious a problem is climate change?	-0.233 (0.105)	0.027
	Religiosity	-0.157 (0.093)	0.090
	Education	-0.017 (0.059)	0.775
	Non-white dummy	0.612 (0.301)	0.042

Reference Category: Harm		**B**	**p-value**
Character	Intercept	1.357 (1.017)	0.182
	Age	-0.20 (0.009)	0.001
	Gender	0.049 (0.246)	0.841
	How serious a problem is climate change?	-0.777 (0.155)	0.001
	Ideology	0.201 (0.112)	0.074
	Religiosity	-0.018 (0.131)	0.889
	Education	-0.100 (0.071)	0.160
	Hispanic Heritage	0.239 (0.477)	0.617
	Non-white dummy	0.464 (0.403)	0.250
	Evangelical dummy	-0.158 (0.316)	0.618
	Political Party	0.748 (0.409)	0.068
Duty	Intercept	-0.488 (0.816)	0.550
	Age	-0.009 (0.007)	0.198
	Gender	0.073 (0.193)	0.707
	How serious a problem is climate change?	-0.239 (0.126)	0.059
	Ideology	0.040 (0.085)	0.634
	Religiosity	0.395 (0.104)	0.001
	Education	-0.063 (0.056)	0.260
	Hispanic Heritage	0.033 (0.369)	0.928
	Non-white dummy	-0.380 (0.252)	0.131
	Evangelical dummy	0.112 (0.242)	0.644
	Political Party	0.247 (0.307)	0.421
Reference Category: Duty		**B**	**p-value**
Character	Intercept	1.845 (1.097)	0.093
	Age	-0.021 (0.010)	0.040
	Gender	-0.023 (0.269)	0.931
	How serious a problem is climate change?	-0.538 (0.167)	0.001
	Ideology	0.160 (0.121)	0.186
	Religiosity	-0.412 (0.146)	0.005
	Education	-0.037 (0.078)	0.636
	Hispanic Heritage	0.205 (0.518)	0.692
	Non-white dummy	0.843 (0.423)	0.046
	Evangelical dummy	-0.270 (0.334)	0.420
	Political Party	0.501 (0.445)	0.261

In this test of robustness, with a one unit increase in religiosity the log-odds of preferring duty over character increases by 0.412 scale points ($p \leq 0.005$). This is not found in all tests of robustness but is something to consider—that religious people are more likely to find deontology more persuasive than utilitarianism *and* virtue ethics. The variables of the original test of this study also contain variables that are more likely to affect which framework is most persuasive (rather that the ones switched in here, for tests of robustness). The main reason for the difference between tests of robustness and the test of the study is the inclusion of political party (Republicans v. Democrats), which is not a statistically significant variable in and of itself). More research on this variable could be warranted.

Reference Category: Harm		**B**	**p-value**
Character	Intercept	0.797 (1.044)	0.445
	Age	-0.028 (0.009)	0.002
	Gender	0.062 (0.247)	0.800
	How serious a problem is climate change?	-0.780 (0.156)	0.001
	Ideology	0.197 (0.112)	0.077
	Religiosity	0.026 (0.117)	0.822
	Education	-0.089 (0.078)	0.256
	Hispanic Heritage	0.294 (0.479)	0.539
	Non-white dummy	0.490 (0.403)	0.225
	Christian non-Evangelical dummy	0.387 (0.255)	0.128
	Political Party	0.769 (0.414)	0.064
Duty	Intercept	-0.548 (0.845)	0.517
	Age	-0.009 (0.007)	0.207
	Gender	0.068 (0.194)	-0.725
	How serious a problem is climate change?	-0.225 (0.127)	0.077
	Ideology	0.052 (0.084)	0.533
	Religiosity	0.390 (0.098)	0.001
	Education	-0.077 (0.062)	0.218
	Hispanic Heritage	0.044 (0.370)	0.906
	Non-white dummy	-0.369 (0.252)	0.143
	Christian non-Evangelical dummy	0.064 (0.196)	0.744
	Political Party	0.253 (0.308)	0.412
Reference Category: Duty		**B**	**p-value**
Character	Intercept	1.345 (1.135)	0.236
	Age	-0.019 (0.010)	0.055
	Gender	-0.006 (0.269)	0.983
	How serious a problem is climate change?	-0.566 (0.168)	0.001
	Ideology	0.145 (0.120)	0.229
	Religiosity	-0.364 (0.132)	0.006
	Education	-0.012 (0.085)	0.890
	Hispanic Heritage	0.250 (0.521)	0.631
	Non-white dummy	0.859 (0.423)	0.043
	Christian non-Evangelical dummy	0.323 (0.277)	0.243
	Political Party	0.516 (0.450)	0.251

Appendix 7. Pearson Correlations of the Independent Variables of Chapter 2

Top number is Pearson correlation, bottom number in parentheses is the p-value.

	Religiosity	Income	Education	Hispanic	Age	Gender	Non-white dummy	Christian dummy	Perceived serious	Not warming dummy
Ideology	-0.400 (0.001)	-0.046 (0.112)	0.067 (0.021)	-0.049 (0.087)	-0.168 (0.001)	0.118 (0.001)	0.154 (0.001)	-0.326 (0.001)	0.561 (0.001)	-0.270 (0.001)
Religiosity	--	-0.030 (0.293)	-0.042 (0.143)	-0.013 (0.647)	0.120 (0.001)	0.073 (0.011)	0.048 (0.094)	0.575 (0.001)	-0.220 (0.001)	0.155 (0.001)
Income	--	--	0.420 (0.001)	0.002 (0.936)	0.109 (0.001)	-0.095 (0.001)	-0.014 (0.623)	0.080 (0.006)	-0.037 (0.199)	-0.055 (0.058)
Education	--	--	--	0.028 (0.333)	0.089 (0.002)	-0.058 (0.046)	0.038 (0.184)	0.038 (0.186)	0.028 (0.339)	-0.052 (0.070)
Hispanic	--	--	--	--	0.161 (0.001)	-0.016 (0.581)	-0.123 (0.001)	-0.015 (0.597)	-0.119 (0.001)	0.039 (0.183)
Age	--	--	--	--	--	-0.109 (0.001)	-0.113 (0.001)	0.150 (0.001)	-0.179 (0.001)	0.055 (0.060)
Gender	--	--	--	--	--	--	-0.048 (0.095)	0.000 (0.998)	0.164 (0.001)	-0.023 (0.433)
Non-white dummy	--	--	--	--	--	--	--	-0.051 (0.075)	0.158 (0.001)	-0.044 (0.127)
Christian dummy	--	--	--	--	--	--	--	--	-0.193 (0.001)	0.055 (0.056)
Perceived seriousness of CC	--	--	--	--	--	--	--	--	--	-0.462 (0.001)

Appendix 8. Dependent Variable T-test of Chapter 3

Below is the paired samples T-test showing that the responses to dependent variables are statistically different:

Paired Differences							
Mean	Std. deviation	Std. error mean	95% Confidence Interval of the Difference		t	df	P-value
			Lower	Upper			
0.505	1.475	0.043	0.422	0.589	11.871	1,200	0.001

Appendix 9. Correlations of Independent Variables of Chapter 3

Top number is Pearson correlation, bottom number is p-value.

	Religiosity	Income	Education	Hispanic	Age	Gender	White dummy	Evangelical dummy	Perceived seriousness	Human caused dummy	Democratic dummy
Ideology	-0.400 (0.001)	-0.046 (0.112)	0.067 (0.021)	-0.049 (0.087)	-0.168 (0.001)	0.118 (0.001)	-0.154 (0.001)	-0.344 (0.001)	0.561 (0.001)	0.486 (0.001)	0.558 (0.001)
Religiosity	--	-0.030 (0.293)	-0.042 (0.143)	-0.013 (0.647)	0.120 (0.001)	0.073 (0.011)	-0.048 (0.094)	0.486 (0.001)	-0.220 (0.001)	-0.215 (0.001)	-0.153 (0.001)
Income	--	--	0.420 (0.001)	0.002 (0.936)	0.109 (0.001)	-0.095 (0.001)	0.014 (0.623)	-0.082 (0.004)	-0.037 (0.199)	-0.015 (0.602)	-0.004 (0.878)
Education	--	--	--	0.028 (0.333)	0.089 (0.002)	-0.058 (0.046)	-0.038 (0.184)	-0.076 (0.008)	0.028 (0.339)	0.074 (0.011)	0.090 (0.002)
Hispanic	--	--	--	--	0.161 (0.001)	-0.016 (0.581)	0.123 (0.001)	0.031 (0.281)	-0.119 (0.001)	-0.087 (0.003)	-0.028 (0.329)
Age	--	--	--	--	--	-0.109 (0.001)	0.113 (0.001)	0.050 (0.083)	-0.179 (0.001)	-0.181 (0.001)	-0.075 (0.009)
Gender	--	--	--	--	--	--	0.048 (0.095)	0.019 (0.516)	0.164 (0.001)	0.089 (0.002)	0.119 (0.001)
White dummy	--	--	--	--	--	--	--	-0.007 (0.798)	-0.158 (0.001)	-0.130 (0.001)	-0.197 (0.001)
Evangelical dummy	--	--	--	--	--	--	--	--	-0.227 (0.001)	-0.176 (0.001)	-0.150 (0.001)
Perceived seriousness of CC	--	--	--	--	--	--	--	--	--	0.704 (0.001)	0.379 (0.001)
human caused dummy	--	--	--	--	--	--	--	--	--	--	0.376 (0.001)

Appendix 10. Tests of Robustness for Chapter 3

Several tests of robustness were performed to verify results found:

	Decision-Making Statement	
	B (st. error)	p-value
Constant	2.027 (0.327)	0.001
Gender	-0.031 (0.060)	0.605
Age	-0.008 (0.002)	0.001
Hispanic Heritage	-0.040 (0.109)	0.715
White Dummy	0.146 (0.083)	0.079
Political Ideology	0.076 (0.022)	0.001
Annual Income	0.005 (0.010)	0.598
Education level	0.010 (0.019)	0.619
Religiosity	-0.007 (0.037)	0.849
Non-Religious Dummy	-0.109 (0.090)	0.222
Not warming dummy	-0.080 (0.102)	0.433
Perceived Seriousness of CC	0.535 (0.041)	0.001
R^2	0.273 (0.987)	--
N	1202	

	Decision-Making Statement	
	B (st. error)	p-value
Constant	2.516 (0.251)	0.001
Gender	-0.002 (0.059)	0.970
Age	-0.008 (0.002)	0.001
Political Ideology	0.051 (0.023)	0.025
Religiosity	0.002 (0.038)	0.966
Christian Non-Evangelical Dummy	0.164 (0.080)	0.041
Non-Religious Dummy	0.021 (0.118)	0.860
Religious Non-Christian Dummy	0.086 (0.125)	0.492
Not warming dummy	-0.366 (0.120)	0.002
Natural increases dummy	-0.353 (0.086)	0.001
Perceived Seriousness of CC	0.422 (0.047)	0.001
R^2	0.287 (0.984)	--
N	1202	

	Beliefs Statement	
	B (st. error)	p-value
Constant	2.768 (0.306)	0.001
Gender	-0.120 (0.072)	0.094
Age	-0.006 (0.003)	0.027
Political Ideology	0.065 (0.027)	0.017
Religiosity	0.115 (0.047)	0.014
Christian Non-Evangelical Dummy	-0.003 (0.097)	0972
Non-Religious Dummy	0.154 (0.143)	0.284
Religious Non-Christian Dummy	-0.055 (0.152)	0.718
Not warming dummy	-0.264 (0.146)	0.071
Natural increases dummy	-0.282 (0.105)	0.007
Perceived Seriousness of CC	0.108 (0.058)	0.061
R^2	0.062 (1.200)	--
N	1202	

	Beliefs Statement	
	B (st. error)	p-value
Constant	2.833 (0.323)	0.001
Gender	-0.121 (0.072)	0.093
Age	-0.006 (0.003)	0.023
Political Ideology	0.049 (0.031)	0.114
Democrat dummy	0.109 (0.110)	0.322
Independent dummy	0.045 (0.091)	0.622
Education level	-0.008 (0.021)	0.718
Religiosity	0.115 (0.045)	0.010
Non-Religious Dummy	0.172 (0.108)	0.112
Not warming dummy	-0.253 (0.147)	0.085
Natural increases dummy	-0.269 (0.106)	0.011
Perceived Seriousness of CC	0.103 (0.058)	0.074
R^2	0.054 (1.201)	--
N	1202	