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Shifting Republican Environmental Attitudes Using Moral Foundations Theory

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Submitted to the Departments of Political Science and Environmental Science of Allegheny College in partial fulfillment of the requirements for the degree of Bachelor of Science.

I hereby recognize and pledge to fulfill my responsibilities as defined in the Honor Code and to maintain the integrity of both myself and the College community as a whole.

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Abstract

As polarization between liberals and conservatives has increased in recent years, so has polarization on environmental issues. Using moral foundations theory, this study examines whether appealing to a moral intuition that is prevalent among conservatives (ingroup/loyalty) can shift Republican views in a proenvironmental direction. Respondents were presented with one of three treatments – climate change framed as harm to human life, climate change framed as threat to one's ingroup and community, and no frame – in order to test the following hypothesis: that Republican respondents presented with the ingroup/loyalty environmental argument will exhibit more favorable environmental attitudes than Republicans exposed to the harm/care and the control treatments. I find some support for this hypothesis, as exposure to the ingroup frame generally increased support for environmental protections among conservatives relative to the harm and control treatments. Climate change will pose increasing challenges to the United States, necessitating policy solutions and cooperation from both Democrats and Republicans. Further research is required to see if the trends are present in a national sample, but these results do raise the possibility of a new framing strategy for conservative climate action.

Introduction

Climate change, the increase of global temperatures due to human-caused greenhouse gas emissions, threatens current and future problems both for natural ecosystems and human society. In the last few decades, climate scientists have observed progressively warmer global surface temperatures per decade, unprecedented in the last 1400 years. Besides warming average temperatures, the world has seen various changes, including rapidly warming and acidifying oceans, sea level rise, decrease in the mass of the Greenland and Antarctic ice sheets, decrease in spring snow cover in the Northern Hemisphere, and rapid decrease in Arctic sea ice extent (IPCC, 2014).

The rapidly increasing rate of global warming is due to a massive increase in atmospheric greenhouse gases (carbon dioxide, methane, and nitrous oxide), currently at levels unprecedented in the last 800,000 years. Industrial processes and the burning of fossil fuels, driven by economic and population growth since the pre-industrial era, have produced drastic increases in greenhouse gases emissions (IPCC, 2014). Greenhouse gases like carbon dioxide have long staying power, meaning that once put into the atmosphere, they remain far into the future – the half-life of atmospheric carbon dioxide is 100 years. As emissions continue to rise, greenhouse gases accumulate for increasingly longer periods of time (Steffen, 2011).

Climate change promises to have wide-reaching and, in many projections, devastating ramifications for natural and human systems. Organisms have shifted their ranges, migration patterns, and species interactions in response to climate change, and marine organisms have been harmed by ocean acidification (Karl et al., 2009; IPCC, 2014). Other species, less able to adapt and threatened by other human activities, face extinction (IPCC, 2014). Changes to natural environments have consequences for human society. Climate change increases the incidence of

heat waves and extreme weather events and raising the sea level, threatening human health and survival directly (Hanna, 2011; Karl et al., 2009). Famine, social disruption, population displacement, and resource competition can be indirectly caused and exacerbated by climate change, having lasting ramifications for global security (Gilman et al., 2011; Hanna, 2011).

The scientific consensus on the existence and causes of climate change is sufficiently robust; around 97% of actively publishing climate scientists hold the view that the recent century's warming trends are extremely likely due to human actions (Cook et al., 2013, 2016). Various reviews (Anderegg et al., 2010; Cook et al., 2013, 2016; Doran & Zimmerman, 2009; Oreskes, 2004; Verheggen et al., 2014) have explored the scientific consensus on anthropogenic climate change, finding levels of agreement among climate scientists ranging from 91% (Verheggen et al., 2014) to 100% (Oreskes, 2004). Cook et al. (2016) found the oft-cited 97% figure to be consistent and robust. Scientific organizations in the United States and around the world have issued statements in consensus with the view that the changing climate is very likely caused by human actions, including science academies, governmental agencies, intergovernmental bodies, and American scientific societies (for a relatively comprehensive list, see NASA, n.d.).

Climate change threatens the physical, biological, and chemical requirements of life, as well as the basic characteristics of modern society. Because of the far reaching and global nature of its causes and consequences, the problem requires action both on the national and international scale (Steffen, 2011). Individual action or relying on the collective actions of citizens is not enough. If the global community has any hope of staving off the worst case scenarios, nations must immediately implement policy or risk further exacerbating the problems to come. Furthermore, an individual nation's ability to adapt to inevitable future consequences

relies on both an acceptance of the problem and a willingness to address it with policy (Karl et al., 2009). In the absence of international leadership, individual nations, especially those like the United States, who have some of the highest per capita outputs of carbon dioxide (Gillis & Popovich, 2017), have the responsibility to act to mitigate the potential consequences both to the rest of the world, and to themselves.

Historically considered nonpartisan, environmental causes within the United States have been furthered by both Republicans and Democrats – from Richard Nixon, who established the Environmental Protection Agency, to Franklin Delano Roosevelt, whose New Deal included provisions for soil conservation (Dunlap & McCright, 2008). Despite its bipartisan past, over recent years the environment has been subject to the same intense political polarization as other cultural and political issues. Today, political party identification remains the single strongest factor to predict environmental attitudes and voting behavior (Coan & Holman, 2008; Dunlap et al., 2001; Gromet et al., 2013; Nisbet et al., 2015). Republicans show disproportionately lower support for environmental views of all kinds, and are especially skeptical about climate change when compared to Democrats. Despite the scientific consensus that the rise in global temperatures as a result of anthropogenic inputs of greenhouse gases will have a wide array of negative social, economic, and environmental consequences, there exists in the United States no political consensus. Republicans and Democrats differ in the degree to which they accept that climate change is even happening, that its causes are anthropogenic, that the scientific consensus is sufficiently robust, and that it should be addressed with policy.

Although a majority of Americans agree that global temperatures are rising due to anthropogenic input of greenhouse gases into the atmosphere, and although the scientific consensus is quite robust, agreement is very much divided by partisan and ideological identity

(Dunlap & McCright, 2008). The moderate increase in public opinion over recent years can be attributed solely to a higher level of Democratic agreement, as the level of Republican agreement remains stagnant (Dunlap & McCright, 2008). Prior to the mid-1990s, few issues were highly polarized. During the mid-1990s and onward, the public became ideologically and politically polarized on various cultural, social, and economic issues, including the environment (McCright & Dunlap, 2011). Today, Democratic citizens are more likely than Republican citizens to express confidence in the theory of anthropogenic climate change and more likely to express concern about the future consequences of climate change (McCright & Dunlap, 2011) There is robust observance of this deep polarization on the issue of climate change (see: Guber, 2013; Leiserowitz et al., 2017a; Leiserowitz et al., 2017b; McCright, 2011; Mildenberger et al., 2017).

Scholars put forward a number of explanations for this intense public polarization in opposition to broad scientific agreement. Some describe an organized effort by conservatives and their allies to discredit accepted climate science in order to turn public opinion away from climate action and further their own interests (Dunlap & McCright, 2011; Jaques et al., 2008; McCright & Dunlap, 2000, 2003, 2010; Oreskes & Conway, 2010). Others posit that the norm of "balanced" media coverage, which ensures equal time to advocates both for and against an issue, falsely represents to the public that climate change science is debated among climate scientists (Boykoff, 2011; Boykoff & Boykoff, 2004, 2007; Boykoff & Rajan, 2007; Corbett & Durfee, 2004; Fisher et al., 2013). Finally, some note the failures of experts to communicate climate science effectively, and the relative inability of people to concern themselves with problems that seem far in the future (Sinatra et al., 2014; Weber & Stern, 2011).

All of these explanations have some validity, and likely played a role in the polarization of the issue over recent years. Yet climate change remains contentious not because Democrats

and Republicans cannot agree on solutions, but because they cannot agree on the very starting premise: that climate change is happening, is caused by human activities, and will threaten human society in the future (Hoffman, 2011). A natural solution to the lack of agreement over scientifically accepted views might seem to be simply increasing the availability of accurate information. However, this idea relies on a view of human cognition as perfectly rational and separated from prior attitudes.

The Bayesian model of reasoning, in which a person collects all relevant information, determines its credibility, and then integrates it and adjust views accordingly, is often considered the ideal mode of reasoning that all people should strive for (Nickerson, 1998; Taber & Lodge, 2006; Taber et al., 2009). Yet increasing evidence indicates that human beings are not such impartial reasoners as Bayesian theory describes. Human beings are motivated reasoners — motivated to reach a conclusion that fits with their worldview, they selectively incorporate information that supports their conclusions and exclude information that rejects their conclusions (Kunda, 1990; Nickerson, 1998; Taber & Lodge, 2006; Taber et al., 2009). More "sophisticated" citizens, the higher educated and more politically informed, are actually more susceptible to motivated reasoning than the less sophisticated (Kahan, 2012; Lodge & Taber, 2005; Myers et al., 2013; Taber & Lodge, 2006). Attempts to correct climate change misinformation based on this deficit model of science communication – the idea that people who adhere to theories that contradicted accepted science are simply operating under a lack of information and upon further education, they will update their views to be more accurate – have systematically failed, and in many cases, have even exacerbated misinformed and factually false views (Dickson, 2005; Kahan et al., 2012).

Education campaigns to correct misinformation usually present the myth and then counter it with the fact. However, when asked to recall the information given to them, people disproportionately misremembered myths as fact (Peter & Koch, 2016). Once people assimilate information, that information influences future judgments, even if the information is correctly recalled as false (Ecker et al., 2011). Although presenting a false statement and then immediately correcting it increases the view that it was false in the short term, after time it increases the chance of it being remembered as true (Skurnik et al., 2005). When given a report containing false information followed by a correction, the misinformation continued to influence even the participants who received strong corrections (Ecker et al., 2011). Because false information continues to influence reasoning even after correction, correcting misinformation is difficult when simply attempting to counter myths with fact. Because human beings are biased information processors, when misinformation connects with perceptions of one's identity, making a correction is even more difficult (Kunda, 1990; Nickerson, 1998; Taber & Lodge, 2006).

Reasoning involves two types of goals: accuracy and directional goals (Kunda, 1990). Taber & Lodge (2006) use the term belief perseverance when writing about directional goals, and specifically focus on partisan goals. Accuracy-motivated reasoning occurs when one desires, above all, to be accurate (Kunda, 1990; Taber & Lodge, 2006). Though accuracy-motivated reasoning has the potential to reduce the effect of cognitive biases, people, regardless of political affiliation, are directionally biased (Kunda, 1990). People use seemingly rational reasoning to justify their directional goals, selectively recalling information to reach the desired conclusion (Kunda, 1990). This grants an "illusion of objectivity," convincing the person that he or she has reasoned in an impartial way (Kunda, 1990).

Though overall one may attempt to find a balance between accuracy-oriented reasoning (which may require more time-consuming, conscientious thought) and belief perseverance, reasoning about sociopolitical issues is inherently tied to previously held beliefs, emotions, and values (Jost et al., 2013; Lodge & Taber, 2005; Morris et al., 2003; Redlawsk, 2002; Taber & Lodge, 2006). Rather than being based on rational considerations, the integration of information is shaped by goals or desires. This is hot cognition (Jost et al., 2013). After a certain sociopolitical concept is first considered, that thought is perpetually "affectively charged" (Morris et al., 2003). A later political stimulus results in the automatic recall of that charge, whether positive or negative, and regardless of its original strength (Morris et al., 2003).

The motivations that shape reasoning are influenced by hot cognition. Motivated reasoning has multiple components: a prior attitude effect (Taber & Lodge, 2006), which can also be termed an attitude congruency bias (Taber et al., 2009); a disconfirmation bias (Edwards & Smith, 1996; Taber & Lodge, 2006); and a confirmation bias (Nickerson, 1998; Taber & Lodge, 2006). The attitude congruency bias occurs when people, influenced by a prior attitude, evaluate supporting arguments as stronger than contrary arguments (Taber & Lodge, 2006; Taber et al., 2009). Disconfirmation bias occurs when people spend more time evaluating and arguing against evidence that does not correspond with their prior views (Edwards & Smith, 1996; Taber & Lodge, 2006). Finally, confirmation bias occurs when seeking out information, people select sources and evidence that will confirm their prior attitudes (Taber & Lodge, 2006). While this can refer to the intentional selection of evidence, it is often difficult to distinguish between deliberate and non-deliberate (Nickerson, 1998). Confirmation bias is often considered as a part of the attitude congruency bias, especially when the confirmation bias is based on unwitting selectivity during evidence gathering (Nickerson, 1998).

When engaging in motivated reasoning, people spend less time processing evidence that supports their prior convictions than evidence that contradicts (Lodge & Taber, 2005; Meffert et al., 2006; Redlawsk, 2002; Sinatra et al., 2014). Increased processing translates into increased time spent using seemingly rational reasoning to counter dissonant information and maintain conclusions consistent with one's identity (Jain & Maheswaran, 2000). When respondents received corrections within the normal context of news (i.e. as a part of a balanced presentation of news, with two sides in opposition to each other), they accepted only corrections that matched with their previous worldviews (Nyhan & Reifler, 2010). Lebo & Cassino (2007) observed that partisans accepted or discounted certain information about the president in office, depending on whether or not the administration's partisan affiliation matched with their own. Partisans whose affiliation matched the president's did not find economic measures of the country's state compelling, believing the president successful regardless of economic indicators (Lebo & Cassino, 2007).

While many scientific topics, including climate change science, are complex and difficult to communicate, and while scientists often fail to communicate the science effectively to the general public, motivated reasoning ensures that the denial of climate change will not be solved with more or better education. In fact, those more educated and more politically informed are the ones who engage in the strongest motivated reasoning (Kahan, 2012; Redlawsk, 2002; Taber & Lodge, 2006; Taber et al., 2009). Because motivated reasoning requires higher levels of cognitive skills, those who are more educated and more informed will be more likely to engage in motivated reasoning (Taber & Lodge, 2006; Taber et al., 2009). Motivated reasoning requires effort, and higher political sophistication imparts an increased ability to counter evidence that disagrees with their perceptions: a larger base of political knowledge and more practiced

reasoning (Taber & Lodge, 2006). Furthermore, the effect of sophistication is enhanced for those more partisan; opportunity (sophistication) and motive (partisan goals) combine to produce the strongest motivated reasoning effects (Taber et al., 2009). Because of motivated reasoning, increased education about climate change will not increase acceptance of the scientific evidence, but only cement people's views even further (Kahan, 2012; Redlawsk, 2002; Taber & Lodge, 2006; Taber et al., 2009).

When it comes to motivated reasoning on political issues, partisan cues play an important role. In the absence of partisan indicators, respondents evaluated the responsibility of a governor for the state's fiscal imbalance in an impartial way, based on the evidence presented – there was no difference in responsibility judgments between Democrats and Republicans (Rudolph, 2006). The presence of partisan cues triggers directional goals that have the purpose of preserving partisan identity. On many issues, Republican and Democratic policy views diverge widely. As polarization intensifies, each party claims ownership over certain issues, and environmental issues have followed this trend (Egan, 2013), becoming, in recent years, fully cemented on the Democratic side (Dunlap & McCright, 2011; Dunlap et al., 2001). On the issue of acceptance of anthropogenic climate change and the need for climate policy, the divergence between Democrats and Republicans is especially polarized (Dunlap & McCright, 2008; Guber, 2013; Leiserowitz et al., 2017a; Leiserowitz et al., 2017b; McCright, 2011; McCright & Dunlap, 2011; Mildenberger et al., 2017).

Because polarization has inextricably bound environmental action with other Democratic views, the concept of climate change is affectively charged in people's minds. Climate change opinions are more tightly associated with partisan views, triggering the directional goal of preserving partisan identity, and the use of biased information processing to fulfill these goals

(Hart & Nisbet, 2012). Conservative distrust of the scientific consensus on climate change may be a direct result of the association between conservative ideology and anti-climate change opinions (Kraft et al., 2015). Hyperskepticism of the accepted scientific view can occur on both sides of the ideological spectrum, depending on the motivations at play – climate action just happens to be linked to Democratic politics (Kraft et al., 2015).

Because all sociopolitical concepts are inherently weighted and charged in one's mind, political reasoning is inevitably filtered through biases like motivated reasoning (Jost et al., 2013; Morris et al., 2003). Human beings are deeply motivated to preserve their identities, of which political views, values, and affiliation are vital aspects (Kahan, 2012; Kunda, 1990). Holding certain views can signal belonging to an ideological group (e.g. liberal or conservative) and the prospect of coming to a conclusion contrary to the accepted position of a cherished group can threaten one's very identity (Kahan, 2012). Motivated by loyalty to one's ideological camp, people gather and assess information in a biased manner in order to support the prior conclusions of that chosen group (Kahan, 2012; Kunda, 1990; Nickerson, 1998).

Some argue that sociopolitical views are sorted into certain ideological camps because political ideology is inherently underpinned by moral values. Moral Foundations Theory (MFT) posits that all people have an innate moral framework, which is shaped by genetics and cultural experience (Graham et al., 2009; Graham, Nosek, & Haidt, 2012; Graham et al., 2012; Haidt, 2008; Haidt & Graham, 2006; Haidt & Graham, 2007; Haidt et al., 2009). Evidence indicates that differences in moral foundations can explain differences in viewpoints between liberals and conservatives, providing a more accurate framework for understanding political ideology (Graham et al., 2009). In this way, political views and affiliation are shaped by the most fundamental and basic aspects of one's identity, their moral values.

Misinformation matters in politics because voters base their political preferences on the information they may believe to be true. Citizens may know when they are uninformed, but they often do not know when they are *misinformed*. When corrections are attempted, especially in regards to controversial political views, human psychology can prevent rational reasoning of all facts (Ecker et al., 2001; Peter & Koch, 2006; Skurnik et al., 2005). Because of the prevalence and power of motivated reasoning, citizens are biased when assimilating new evidence, selectively incorporating evidence that supports their prior conclusions and discarding evidence that counters their prior conclusions (Kunda, 1990; Taber & Lodge, 2006; Taber et al., 2009). Climate change concepts are not inherently political, yet along with the polarization of many other issues, they have become politically charged in people's minds (Jost et al., 2013; Morris et al., 2003). Not only does ideological affiliation provide a clear directional goal that ensures partisans will engage in motivated reasoning, but explicit partisan signaling can exacerbate motivated reasoning as well (Rudolph, 2006). Motivated reasoning prevents the ideal, Bayesian model of reasoning, wherein one takes in all information, evaluates its credibility in an impartial way, and then adjusts one's perceptions up or down (Taber & Lodge, 2006).

Democrats and Republicans are currently "talking past each other" on the issue of climate change – Democrats discuss possible solutions, while Republicans deny there is a problem, discount climate change science, and dismiss the need to reduce human activities at the root of the problem (Hoffman, 2011). Climate change polarization greatly hinders the ability of lawmakers to implement effective climate policy. As the level of greenhouse gases in our atmosphere increase to new levels every year, the social, economic, and environmental ramifications if rates of greenhouse gas input are not reduced become more and more dire (Karl et al., 2009). Because of our pressing need for action on climate change and the power of

motivated reasoning to influence climate change opinions, we require a way to communicate the need for climate change action while avoiding the identity signaling that activates motivated reasoning. Moral Foundations Theory provides framework for understanding the underlying causes of political belief and provides new and informed strategies for conservative environmental communication.

Moral Foundations Theory

Traditional understanding of morality was based solely on the concepts of justice, rights, and welfare, a framework which concerned governing interactions between individuals, particularly in the interest of guarding individual rights (Haidt & Joseph, 2007). Yet many cultures view norms that govern social order in a distinctively moral light (Graham et al., 2009; Haidt & Joseph, 2007). Norms that do not relate specifically to individuals, but instead serve to preserve and protect concepts other than individuals, such as groups, institutions, and responsibilities, and allow groups and societies to function, but were not considered moral in the context of a justice, rights, and welfare morality (Haidt & Joseph, 2007). As a result, conservatives and citizens of non-Western countries were consistently classified in social science as amoral, even immoral, indicating that the view of morality as purely focused on the individual was clearly lacking (Graham et al., 2009).

The realization that morality might be broader than originally thought brought new focus onto the *function* of morality, rather than the content. Morality was defined by abstract generalizations of human nature, involving the pursuit of certain previously established virtues which were often set by religious beliefs (Haidt & Joseph, 2007). But by first determining the function of what we view as moral, we can determine certain behaviors and attitudes that serve those functions. This allows the expansion of morality into attitudes and behaviors that previous conceptualizations of morality overlooked, but in practice, that societies and groups utilized as serving moral purposes (Haidt, 2001; Haidt, 2008; Haidt & Joseph, 2007). Moral systems function as "interlocking sets of values, practices, institutions, and evolved psychological mechanisms that work together to suppress or regulate selfishness and make social life possible," (Haidt, 2008) and they incorporate both an individualizing role – wherein individuals are

protected and respect others' rights, and a binding role – wherein individuals are bound into structured responsibilities to preserve community order and restrain base instincts (Graham et al., 2009; Graham, Nosek, & Haidt, 2012; Graham et al., 2012; Haidt, 2001, 2008; Haidt & Graham, 2006; Haidt & Graham, 2007; Haidt & Joseph, 2007; Haidt et al., 2009).

Focusing on the functions of morality, Moral Foundations Theory (MFT) incorporates previous moral theory in combination with anthropological and evolutionary concepts (Graham et al., 2009; Graham, Nosek, & Haidt, 2012; Graham et al., 2012; Haidt, 2008; Haidt & Graham, 2006; Haidt & Graham, 2007; Haidt & Joseph, 2007; Haidt et al., 2009). MFT currently includes five moral foundations: harm/care, which focuses on caring for others and alleviating suffering; fairness/reciprocity, which focuses on ensuring just and fair outcomes for people; authority/tradition, which means respecting hierarchy and tradition; ingroup/loyalty, which prides loyalty to one's group; and purity/sanctity, which involves the sacredness of the divine and valuing purity.[1] Harm/care and fairness/reciprocity coincide with the previous focus on justice, rights, and welfare; they address the individualizing role of moral systems. Harm/care is evolutionarily derived from empathy and fairness/reciprocity from reciprocal altruism. Authority/tradition and ingroup loyalty are derived from social hierarchy and coalitional psychology, respectively. Finally, the purity/sanctity foundation was developed from disgust and contamination sensitivity. Authority/tradition, ingroup/loyalty, and purity/sanctity address the binding role of moral systems (Graham et al., 2009; Graham, Nosek, & Haidt, 2012; Graham et al., 2012; Haidt, 2008; Haidt & Graham, 2006; Haidt & Graham, 2007; Haidt & Joseph, 2007; Haidt et al., 2009). The authors acknowledge that because the theory is relatively new, these

[1] See Appendix A for summary table.

foundations might not encompass the full range of morality – additional foundations may exist and require more research to test (Graham et al., 2013).

The authors of MFT posit that although the five foundations are universally possessed, they are not universally utilized. Varied reliance on the moral foundations has been demonstrated among cultures, demographic groups, and political ideologies (Haidt & Joseph, 2004; Haidt et al., 1993; Graham et al., 2012; Koleva et al., 2012; Weber & Federico, 2013). Though the moral foundations are universally present, different combinations are cultivated by different cultures and societies, and even further by different subcultures or groups (Koleva et al., 2012). Thus, by emphasizing and deemphasizing certain moral foundations in certain contexts, cultures and groups create practices and perceptions of morality that have incredible variety (Koleva et al., 2012). Moral foundations are "organized in advance of experience" and the "first draft of the moral mind"– they form the basis upon which morality is then shaped by cultural experience (Graham et al., 2012).

Though MFT was originally intended to explain cultural differences in perceptions of morality, researchers have applied this framework to explaining political and ideological differences. Because morality underlies political belief, differences in which moral foundations one relies on affects one's political attitudes (Haidt, 2001). People, due to genetics or cultural experience, are psychologically disposed towards certain political positions, and then sort into their respective ideological groups; therefore different ideological groups have different patterns of accessing and utilizing the moral foundations (Koleva et al., 2012). MFT hypothesized that liberals would consciously subscribe more to the harm/care and fairness/reciprocity domains (i.e. the individualizing foundations), while conservatives would consciously subscribe more to the authority/tradition, ingroup/loyalty, and purity domains (i.e. the binding foundations). If liberals

and conservatives rely on different sets of moral foundations, this would explain the stark divergence between liberals and conservatives on either side of the culture war and why on some issues liberals and conservatives cannot even comprehend the other side's view – their conclusions on issues are rooted in completely different sets of moral foundations (Clifford & Jerit, 2013; Graham et al., 2009; Haidt & Graham, 2006; Haidt & Graham, 2007).

Various scholars have explored MFT in the context of political ideology, finding that the dichotomy between the individualizing and binding moral foundations explained the stark divergence between American liberals and conservatives in regards to many political issues. Liberals are generally characterized as having an "unconstrained vision" of society, in which individuals should be left to pursue their own self-development. Conservatives, on the other hand, have a "constrained vision" of the world, in which people need restraints in the form of social institutions, hierarchies, and tradition to guide behavior. Because the conservative worldview seems to value the binding nature of moral systems, Graham et al. (2009) hypothesized that conservatives would employ the binding foundations more than liberals, whose worldview seems to value the individualizing nature of moral systems more (Graham et al., 2009).

The authors tested whether or not differences in use of the five moral foundations accounted for political divergence between liberals and conservatives. Participants self-reported their reliance on the five foundations when making moral judgments. As predicted, liberals self-reported the individualizing foundations, harm/care and fairness/reciprocity, as more important to them when making moral judgments, while conservatives rated the binding foundations, ingroup/loyalty, authority/tradition, and purity/sanctity, as more important. Even when

accounting for demographic variance, political ideology was the best predictor of the relevance of certain foundations over others (Graham et al., 2009).

In a subsequent study, the authors presented participants with moral tradeoffs, asking them how much they would have to be paid in order to violate each moral foundation. Conservatives required far more money to entice them into violating the binding foundations than liberals did, but showed overall a fairly equal distribution across the five domains. Liberals exhibited much more willingness to violate the binding foundations than the individualizing foundations. Finally, an analysis of sermons revealed that those given in liberal churches utilized the individualizing foundations more frequently than those given in conservative churches, while those in conservative churches utilized the binding foundations more than those in liberal churches. In general, the authors found that liberals employ the harm/care and fairness/reciprocity foundations almost exclusively, whereas conservatives employ all five foundations more evenly across the board. Liberals make decisions primarily utilizing the individualizing foundations – in fact, they may not even view violations of the binding foundations as moral issues (Graham et al., 2009).

In a nationally representative sample, those on the political left utilized the harm/care and fairness/reciprocity foundations disproportionately compared to the latter three foundations, and those on the political right employed all five foundations more evenly (Graham, Nosek, & Haidt, 2012). Furthermore, the differences between the moral foundations utilized by liberals and conservatives extend beyond simply American ideology: Graham et al. (2011) found the same divergences in an online survey of over thirty thousand respondents from eleven world regions.

By examining life narratives of religious liberals and conservatives, McAdams et al. (2008) also tested whether, when making and rationalizing decisions, conservatives rely on the

binding foundations more than liberals do. The study assessed narrative discussions by religious liberals and conservatives of their moral and religious beliefs. Participants discussed these beliefs – what they were, how they were formed, and how they are implemented in day to day life. Inevitably, the discussions hinged on moral issues, and the narratives were rated for their concern for each moral foundation. Overall, the authors discovered stark differences in moral language used by religious liberals and conservatives. When discussing and justifying the formation of their religious and moral beliefs, participants drew upon the five moral foundations in a generalizable way: conservatives drew upon the binding foundations very heavily, while liberals drew upon the individualizing foundations. Although the ability to draw conclusions from the results is limited by the fact that asking about religious beliefs inherently introduces considerations of morality, the study reveals that liberals and conservatives narrate their lives through dramatically different frames (McAdams et al., 2008).

Further studies examined the way that differences between reliance on moral foundations seems to explain liberal-conservative divergence over culture war issues. They sought to illuminate why ideologues hold seemingly incompatible views: for example, how conservatives are against abortion because they are pro-life, but support capital punishment, or how liberals support abortion because of reasons of individual freedom, but support restrictions on gun rights.

Researchers measured moral disapproval on controversial culture issues, in order to attempt to illuminate which factors – demographics, level of political interest, political ideology, or patterns of use of moral foundations (measured through Moral Foundations Questionnaire scores) – predicted attitudes on a variety of culture war issues, including abortion, stem cell research, illegal immigration, and gun control. On the issues, use of the moral foundations of

purity, ingroup, and harm were the highest predictors. These moral scores were the most accurate predictors of positions on the various issues, more accurate than even political ideology, political engagement, demographic characteristics, and sociopolitical attitudes. Certain issues involved the activation of multiple moral foundations, implying that political views are formulated on the basis of complicated interactions of moral motivations. Nonetheless, MFT provides valuable framework for understanding political ideology and predicting positions on various sociopolitical issues (Koleva et al., 2012).

Although a number of studies support that political ideology is connected to certain sets of moral foundations, few studies have attempted to see if MFT can be used to affect views on partisan issues. Knowing that the moral foundations are evoked during political decision making, Day et al. (2014) test whether employing relevant foundations could cause liberals to endorse conservative positions and conservatives to endorse liberal positions. The authors conducted two studies: the first presented participants with conservative stances framed in the five moral foundations; the second presented participants with liberal stances framed in the five moral foundations. They predicted two results for each study: an entrenching result, in which the views of the group exposed to pro-attitudinal stances (e.g. liberals exposed to support for increased economic regulation) framed in relevant moral foundations (e.g. harm/care and fairness/reciprocity for liberals) would become more extreme; and a persuasion result, in which the views of the group exposed to counter-attitudinal stances (e.g. conservatives exposed to support for increased economic regulation) framed in relevant moral foundations (e.g. authority/tradition, ingroup/loyalty, and purity/sanctity for conservatives) would shift towards supporting the counter-attitudinal views (Day et al., 2014).

In the first study, which presented participants with conservative positions framed in terms of the moral foundations, conservatives increased their level of endorsement when exposed to the authority and purity frames, supporting the entrenchment hypothesis. Liberals, however, did not endorse the conservative positions when they were framed in harm and fairness language, countering the persuasion hypothesis. In the second study, which mirrored the first but with liberal positions, liberals increased their support for liberal positions when exposed to all frames, not simply the relevant ones, providing some support for the entrenching hypothesis. When presented with liberal positions framed in terms of the authority/tradition, ingroup/loyalty, and purity/sanctity foundations, conservative views were more liberal, supporting the persuasion hypothesis. Overall, the authors found tentative support for the idea that persuasion through the use of relevant moral frames can produce counter-attitudinal support, though this was shown only to be effective in altering conservative positions. The authors posit that liberal ideological views are more rigid than conservative ideological views, and thus, more consistent, even in the face of persuasive moral framing (Day et al., 2014).

Upon the observation that Americans' stances on environmental issues are extremely polarized, Feinberg & Willer (2013) sought to ascertain if the differences between liberals and conservatives in patterns of moral foundations use were an explanation. The authors conducted three studies to examine the issue. The first study presented participants with a vignette of a person's day – in the description, the person either recycles his water bottle after lunch, does not recycle it, or does not have a water bottle in the first place. Whereas liberals consistently rated the person who did not recycle as less moral than the person who did recycle, conservatives consistently gave the person high moral ratings regardless of whether the person recycled. The

results indicate that liberals inherently view environmental actions and issues as moral, whereas conservatives do not (Feinberg & Willer, 2013).

The authors also analyzed the language used in environmental messaging, which encompassed newspaper op-eds and video public service announcements, and found that both primarily employed the harm/care moral foundation. Although environmental arguments are consistently made in terms of individualizing moral framework, conservatives do not view environmental issues in moral terms – clearly, these moral exhortations do not resonate with conservatives. Given this, the final study tested whether instead of framing environmental action in individualizing terms, framing in terms of a moral foundation relevant to conservatives, purity, could shift conservative environmental attitudes in a positive direction. Conservative participants who received the purity frame had higher proenvironmental attitudes, higher support for environmental legislation, and higher belief in global warming than conservatives in the neutral and harm/care treatment groups. By framing environmental issues in the purity/sanctity foundation, a framework that resonates more with conservatives, the authors effectively closed the gap between liberal and conservative environmental attitudes (Feinberg & Willer, 2013).

Subsequent research indicates support for the results of Feinberg & Willer (2013), that appealing to moral foundations more relevant to conservatives can improve conservative environmental attitudes. Instead of focusing on one moral foundation, the authors created arguments for environmental action in terms of the three binding foundations and in terms of the two individualizing foundations (Wolsko et al., 2016). The binding moral messaging was meant to appeal to conservatives, who find them more resonant than the individualizing foundations, with which environmental messaging is usually crafted (Feinberg & Willer, 2013; Wolsko et al.,

2016). In the first experiment, the argument for environmental action in binding moral terms moderated the ideological divergence in environmental attitudes. Exposure to the binding treatment eliminated the gap between liberals and conservatives on climate change attitudes conservation intentions (Wolsko et al., 2016).

The second experiment replicated the first with a nationally representative survey and with the addition of an environmental donation score. Upon completion of the survey, respondents were given the option to donate any amount of their survey payment (from 0% to 100%) to the Environmental Defense Fund. Once again, the binding moral argument improved conservative environmental attitudes and eliminated the gap between liberal and conservative climate change attitudes and conservation intentions. Additionally, conservative participants exposed to the binding frame donated in higher amounts than conservatives exposed to the individualizing or control treatments. Overall, the authors showed that framing environmental action in terms of the binding moral framework that appeals more to conservatives can increase conservation intentions, climate change belief, and environmental donations, eliminating the gap between liberals and conservatives (Wolsko et al., 2016).

In order to test whether relevant moral framing could be used to shift recycling intention and behavior, Kidwell et al. (2013) used individualizing and binding moral foundations to frame messages encouraging increased recycling. The authors measure recycling intentions after exposure to an individualizing message, binding message, or no message, finding that frames congruent with participant ideology (i.e. liberals receiving the individualizing frame or conservatives receiving the binding frame) produce increased recycling intentions relative to control (Kidwell et al., 2013).

After determining that relevant frames can shift recycling attitudes, the authors tested the ability of framing to change behavior. The authors recruited households and assigned them to receive a message encouraging the household to recycle framed in individualizing terms or binding terms, then measured their recycling behavior in response to the different frames of environmental action. Households in the control group received no message encouraging recycling. Household recycling weight was measured over nine weeks, and showed a clear response, depending on household ideological affiliation (ideological affiliation of the household head) to the recycling messages. Exposure to congruent moral appeals increased weekly rates of recycling: if a liberal household received the individualizing frame or if a conservative household received the binding frame, their recycling rates increased relative to control. Using relevant moral foundations can enhance both liberal and conservative recycling intentions and behavior (Kidwell et al., 2013). Taken together, the results of Feinberg & Willer (2013), Wolsko et al. (2016), and Kidwell et al. (2013) indicate the possibility of relevant moral foundations to increase conservative environmental attitudes, intentions, and behavior.

In summary, Moral Foundations Theory provides a novel way to think about morality: as an innate, universal framework developed through evolutionary mechanisms and affected by cultural practice. Though originally intended mainly for application in cultural psychology, research has shown the potential for MFT to explain the underlying mechanisms behind specific liberal-conservative ideological disagreements, including the polarization of climate change and environmental action. Past scholarship indicates that framing, changing the way we communicate to better appeal to a person's values or worldview, has the potential to shift opinion in meaningful ways. Framing general environmental issues differently has had success in shifting views in a positive direction (see Baldwin & Lammers, 2016). More specifically, framing

climate change and climate action differently can also shift views in a positive direction (see Daub, 2010; Hardisty et al., 2010; Schuldt et al., 2011). Effectively framing climate change differently might even promote different behaviors in climate deniers (Bain et al., 2012; Kidwell et al., 2013). The use of moral foundations holds the possibility of an even further nuanced approach to frame climate action appeals. If the correct moral foundation is chosen, the argument can activate a person's psychologically ingrained sensibilities that underlie and overpower even political ideology.

Because current research indicates that relevant moral foundations can be mobilized in order to effectively shift political attitudes, the goal of my study was to use moral language relevant to conservatives to shift environmental attitudes in a proenvironmental direction. My study presents three groups of respondents with arguments about the need to address climate change, framed in terms of moral foundations – one group receives an argument framing climate action in terms of the harm/care framework, one receives an argument framing climate action in terms of ingroup/loyalty framework, and the control group receives no article. After exposure to the treatments, respondents answer a survey that measures environmental attitudes. I predict the following:

> *(H1) Because harm/care language is the typical frame used with environmental issues, Republican environmental attitudes will be similar in the control and harm/care treatments;*
>
> *(H2) Because the ingroup moral foundation resonates more with conservatives than liberals, the ingroup frame for climate action will increase Republican levels of agreement for climate action, relative both to the control and to the harm condition; and*

(H3) Because Democrats have generally high levels of environmental attitudes, they will exhibit relatively similar levels of proenvironmental attitudes, regardless of the treatment.

Finding support for these hypotheses, and in particular, for H2, would provide policy makers and environmental advocates effective language for framing environmental issues.

Methods

Participants

In the months of October and November 2017, a set of treatments and a subsequent survey were administered through the Political Science Department of the University of Illinois. The study was administered to four hundred and thirteen undergraduate students at the University of Illinois as part of a larger body of studies. Respondents received extra credit in political science courses in return for their participation, but could choose to opt out of questions if desired.

Demographic characteristics of the respondents were measured, including gender, locale (rural-suburban-urban), social class, race, and political affiliation (party and ideology). The sample was predominantly female (226 female, 187 male), suburban (49.5%), middle class (61.8%), and white (53%). The sample consisted largely of Democrats, with 267 Democrats, 52 Independents, and 94 Republicans. Partisan affiliation correlated strongly with political ideology (R^2=0.805).

Survey Instrument

Participants were presented with one of three treatment conditions: control (no frame), harm/care, and ingroup/loyalty. The harm and ingroup frames were each in the form of a news article detailing a call to climate action by a local representative (no party affiliation was given), and the control group received no mock news article. The treatments used language that typically characterizes their respective moral frames, as listed in Appendix D of Graham et al. (2009).[2] The harm/care treatment emphasizes the need for environmental action to prevent harm to both human life and livelihood in communities around the world. The ingroup/loyalty treatment

[2] See Appendix A.

frames environmental action as inherently patriotic and necessary for the one's descendants and one's community to thrive.[3] Respondents were randomly assigned to treatments ($n_{control}$= 138, n_{harm} = 138, $n_{ingroup}$ = 137).

The survey, administered following exposure to the treatments, measured participants' various environmental attitudes. Participants indicated their level of agreement with various environmental attitudes on a four-point Likert scale (strongly disagree - disagree - agree - strongly agree). Of the variables measured, there were four general categories: climate change attitudes, general environmental attitudes, environmental governance attitudes, and environmental policy attitudes (for a full list of the variables, see Appendix D).

Data Analysis

To determine the effects of treatment on partisan environmental attitudes, I created linear models that controlled for the demographic variables detailed above.

[3] Summary table of treatments can be found in Appendix B. The experimental treatments as respondents saw them can be found in Appendix C, and the variables measured can be found in Appendix D.

Results and Discussion

I hypothesized the following:

(H1) Because harm/care language is the typical frame used with environmental issues, Republican environmental attitudes will be similar in the control and harm/care treatments;

(H2) Because the ingroup moral foundation resonates more with conservatives than liberals, the ingroup frame for climate action will increase Republican levels of agreement for climate action, relative both to the control and to the harm condition; and

(H3) Because Democrats have generally high levels of environmental attitudes, they will exhibit relatively similar levels of proenvironmental attitudes, regardless of the treatment.

Republican Response to Control and Harm/Care Environmental Framing

My results indicate support for H1, as Republican environmental attitudes remained generally consistent between the control and harm/care treatments. Conservatives utilize the five moral foundations more evenly, so harm/care can be a relevant moral foundation to conservatives (Graham et al., 2009). Yet the harm/care treatment does not result in increased Republican environmental attitudes relative to control. This may be because conservatives do not explicitly endorse harm/care as particularly relevant to their moral reasoning (Graham et al., 2009). Additionally, while liberals see environmental issues as inherently moral, conservatives do not (Feinberg & Willer, 2013). The default messaging, despite its associations with harm/care language, clearly does not evoke moral considerations in conservatives (Feinberg & Willer, 2013). Thus, conservative environmental attitudes in a default setting and after exposure to harm/care framing are generally similar.

Republican Response to Ingroup/Loyalty Environmental Framing

Attitude	Attitude Description	Difference between Republican*Ingroup and Republican*Control Attitudes	Did the change cross neutral?
Climate Change Attitudes			
climchg2	The majority of scientists and experts agree that climate change is happening.	+0.28	no
climchg3	Greenhouse gas emissions (for example, from burning fossil fuels) are the primary cause of climate change.	+0.26	no
General Environmental Attitudes			
envcost	The costs of not addressing environmental problems are much higher than the costs of addressing the environmental problems.	+0.27	no
envprt	It is important to protect the environment from harm.	+0.34	no
envgod	Taking good care of nature is part of our duty to God.	+0.51	YES
Environmental Governance Attitudes			
fedleg	The federal government should produce legislation aimed at protecting the environment.	+0.31	no
fedrrl	The federal government should be doing more to mitigate the effects of climate change on rural communities.	+0.23	no
fedurb	The federal government should be doing more to mitigate the effects of climate change on urban communities.	+0.18	no
partyenv	The lawmakers in my political party are better prepared and suited to address environmental problems.	+0.52	YES
Environmental Policy Attitudes			
greenhs	The United States should take steps to reduce its greenhouse emissions.	+0.22	no
grwth	We can achieve environmental protection and economic growth at the same time.	+0.3	no

Table 1. Summary of support for H2 (Republicans in the ingroup/loyalty treatment group will express stronger proenvironmental attitudes than those in the control or harm/care treatment groups). Difference between Republican*Ingroup and Republican*Control is the difference between average agreement with various environmental attitudes of Republicans in the ingroup/loyalty treatment group and that of Republicans in the control group. Whether the change crossed neutral is simply a question of whether the shift in average Republican attitudes due to treatment changed attitudes from average disagree to average agree or from average agree to average disagree, crossing the neutral point at 1.5. Variables whose models showed no difference in Republican attitudes among treatments are not included in the table.

Though statistical analysis reveals no significant shifts in conservative attitudes as a result of the ingroup/loyalty frame, the results indicate a consistent pattern: exposure to the argument for environmental action framed in terms of the ingroup/loyalty moral foundation shifted Republican attitudes in a proenvironmental direction, relative to the control and harm/care treatments. These trends would likely be amplified in a national sample.

Climate Change Attitudes

Legend:
Party Affiliation: 1: Democrat, 2: Independent, 3: Republican
Agreement: 0: strongly disagree, 1: disagree, 2: agree, 3: strongly agree
Treatment: —— Control - - - Harm — - Ingroup

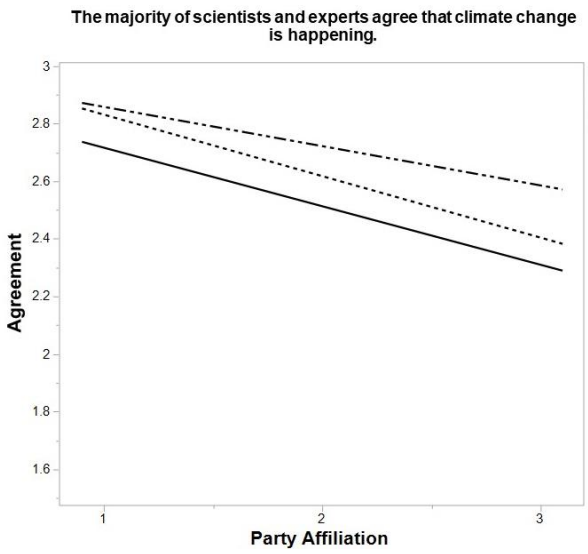


Figure 1. Levels of agreement with climchg2 by political affiliation and treatment group.

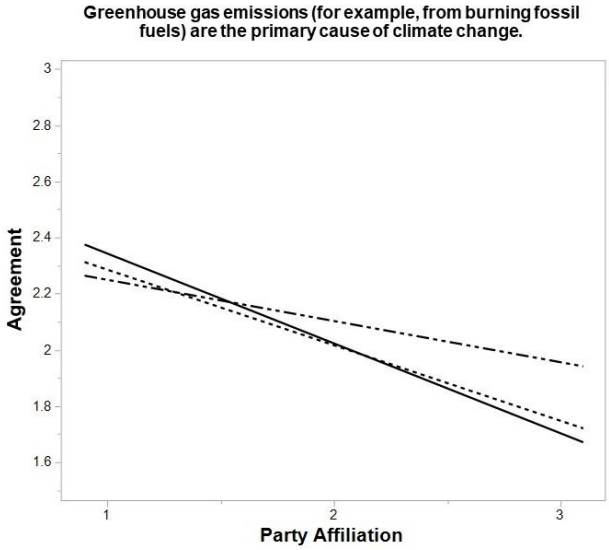


Figure 2. Levels of agreement with climchg3 by political affiliation and treatment group.

In response to the ingroup/loyalty frame, the climate change attitudes of conservatives increased; conservative agreement increased by +0.28 (Fig. 1, Table 1) and +0.26 (Fig. 2, Table 1) for climchg2 ("The majority of scientists and experts agree that climate change is happening") and climchg3 ("Greenhouse gas emissions (for example, from burning fossil fuels) are the primary cause of climate change."), respectively. These represent generally modest improvement of

attitudes. However, Republican attitudes in those areas are already unusually high compared to Republicans nationally, as detailed later. The gap between Democratic and Republican views on climate change in this sample is already very small to begin with, meaning that any increase in agreement would be small. Thus, drawing conclusions is difficult, but the trend indicates that the ingroup/loyalty treatment caused increased levels of belief in the fact that climate change is caused by anthropogenic greenhouse gas emissions and agreement that the scientific consensus on the existence of climate change is robust.

General Environmental Attitudes

Legend:
Party Affiliation: 1: Democrat, 2: Independent, 3: Republican
Agreement: 0: strongly disagree, 1: disagree, 2: agree, 3: strongly agree
Treatment: Control Harm Ingroup

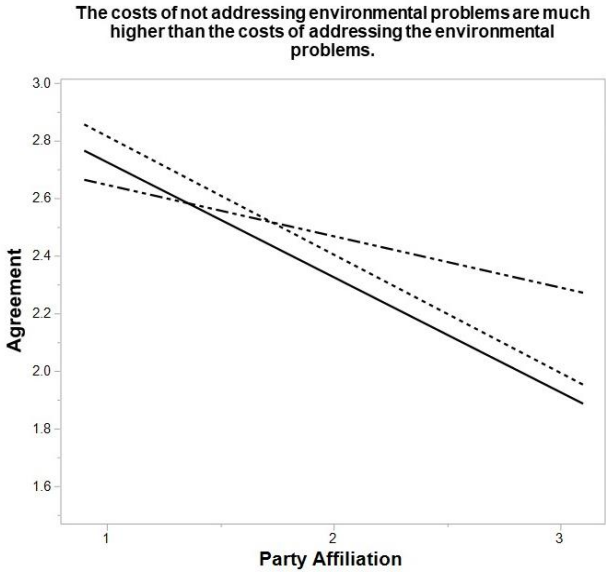


Figure 3. Levels of agreement with envcost by political affiliation and treatment group.

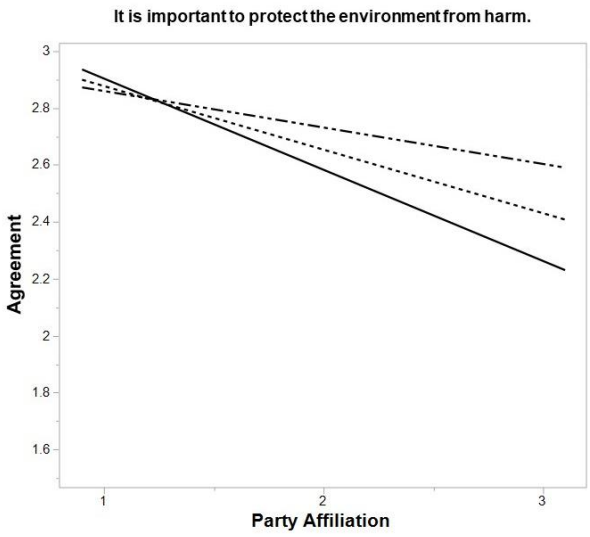


Figure 4. Levels of agreement with envprt by political affiliation and treatment group.

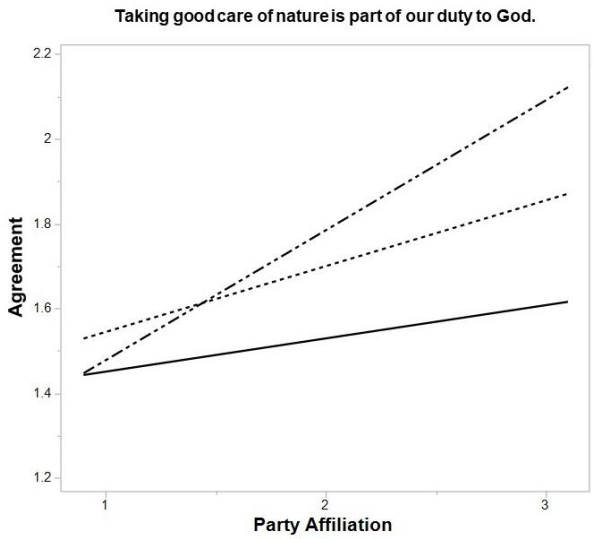


Figure 5. Levels of agreement with envgod by political affiliation and treatment group. (Note that the scale is different.)

Republicans in the ingroup/loyalty treatment group expressed higher agreement with a number of general environmental attitudes than those in the control and harm/care groups, including envcost, envprt, and envgod. There was a +0.27 improvement from control in Republican agreement with envcost (Fig. 3, Table 1), "The costs of not addressing environmental problems are much higher than the costs of addressing the environmental problems," suggesting that the threat that climate change and environmental degradation poses to the ingroup described in the ingroup/loyalty frame resonated with Republicans.

Republicans in the ingroup/loyalty treatment group increased agreement with envprt ("It is important to protect the environment from harm") by +0.34 (Fig. 4, Table 1), compared to those in the control group, an unusual result because the statement clearly discusses environmental issues in terms of harm, while the ingroup/loyalty frame focuses on that frame. Furthermore, though the harm/care frame evokes more agreement in Republicans than in the control, this shift is greater for those in the ingroup/loyalty treatment group. The shift in Republican opinion may

be because the ingroup/loyalty frame included some consideration of harm in it (in that it argued environmental decline was a threat to one's ingroup – see page 46 for a more in-depth discussion). Another possibility is that whereas environmental issues framed solely in harm/care frame are not viewed in moral terms by Republicans, the framing of environmental issues in a relevant frame might cause Republicans to be more open to other moral arguments, including harm/care.

There was also an increase in levels of Republican agreement with envgod ("Taking good care of nature is part of our duty to God") in the ingroup/loyalty treatment group relative to the control group (+0.51) (Fig. 5, Table 1). This statement evokes more of a purity consideration than ingroup/loyalty. If the accessing of moral foundations were completely separate, there would be no reason for an increase in Republican agreement with envgod in response to the ingroup/loyalty treatment – the treatment makes no mention of anything that would trigger consideration of purity. The particular relevance of purity to conservatives is well-documented, and Feinberg & Willer (2013) demonstrate the potential for a purity frame to shift conservative environmental attitudes. However, Republicans in the control or harm/care groups did not show higher levels of agreement with envgod, meaning that even though the ingroup/loyalty did not explicitly mention purity, it managed to evoke higher levels of agreement with envgod. When making any political decision, a person utilizes a variety of moral foundations (Graham et al., 2013; Koleva et al., 2012). If the evocation of one foundation that is personally relevant automatically triggers other personally relevant moral considerations, the increase in Republican agreement with envgod as well as envprt in response to the ingroup/loyalty could be explained.

While Republicans in the control treatment on average disagreed with that taking good care of nature is part of our duty to God, Republicans in the ingroup/loyalty on average agreed

with that statement. Thus, not only did the ingroup/loyalty treatment result in one of the largest shifts in our results, but it also shifted Republican average attitudes from disagreement to agreement. The same cannot be said for most of the other variables measured, due to the moderate size of the shifts and the narrowness of the gap between the Democrats and the Republicans in the sample.

Environmental Governance Attitudes

Legend:
Party Affiliation: 1: Democrat, 2: Independent, 3: Republican
Agreement: 0: strongly disagree, 1: disagree, 2: agree, 3: strongly agree
Treatment: Control Harm Ingroup

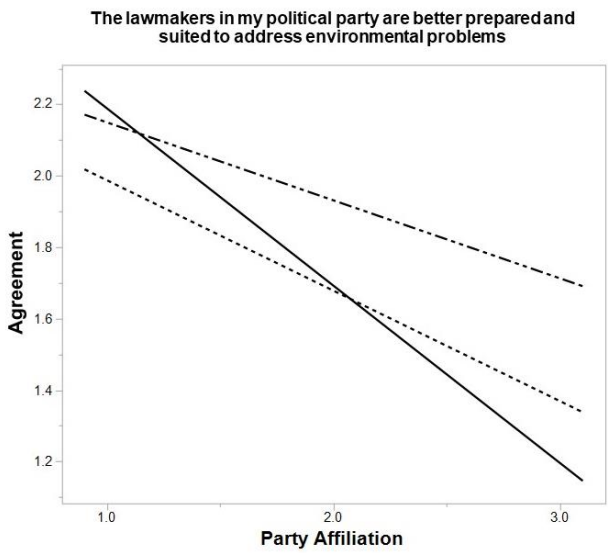


Figure 6. Levels of agreement with partyenv by political affiliation and treatment group. (Note that the scale is different.)

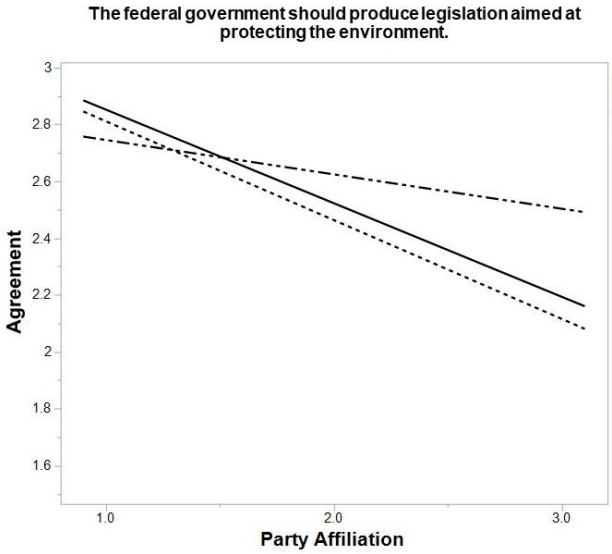


Figure 7. Levels of agreement with fedleg by political affiliation and treatment group.

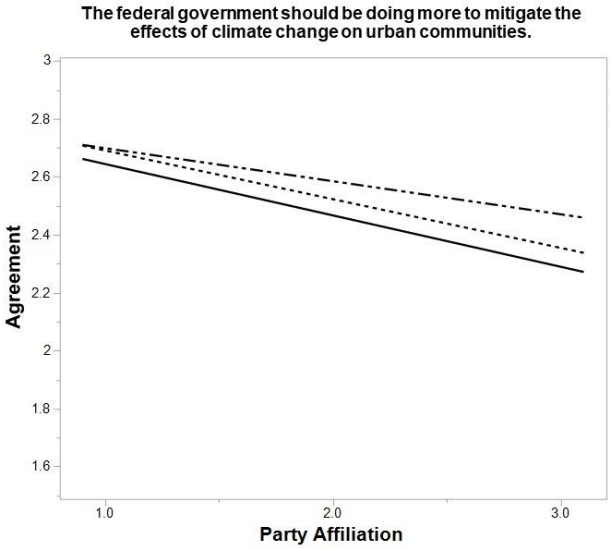


Figure 8. Levels of agreement with fedurb by political affiliation and treatment group.

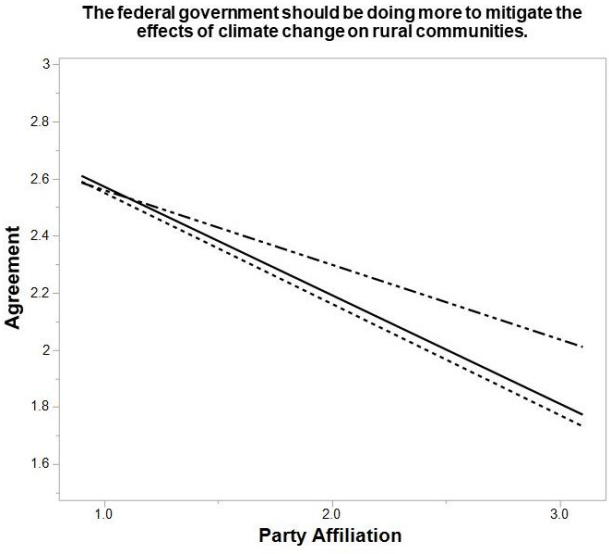


Figure 9. Levels of agreement with fedrrl by political affiliation and treatment group.

My results show additional movement in Republican levels of agreement with various statements about environmental governance, including fedleg ("The federal government should produce legislation aimed at protecting the environment"), fedrrl ("The federal government should be doing more to mitigate the effects of climate change on rural communities"), fedurb ("The federal government should be doing more to mitigate the effects of climate change on urban communities"), and partyenv ("The lawmakers in my political party are better prepared and suited to address environmental problems"). Republicans exposed to the ingroup/loyalty treatment expressed more support (+0.31) for the federal government producing legislation to protect the environment (fedleg) (Fig. 7, Table 1). They also agreed more than control group Republicans that the federal government should be doing more to mitigate the effects of climate change on both rural communities (fedrrl, +0.23) (Fig. 9, Table 1) and urban communities (fedurb, +0.18) (Fig. 8, Table 1). These increases are fairly consistent among all the variables that measured desire for federal environmental action.

However, no such increased agreement occurred among Republicans in the ingroup/loyalty treatment group pertaining to a desire for more state action, private business action, or private citizen action. It is unclear why Republicans, who typically favor state legislation or market strategies would increase desire for federal action in response to the ingroup/loyalty frame rather than desire for state, corporate, or individual action.

The level of agreement of conservatives in the ingroup/loyalty treatment was, on average, +0.52 higher for partyenv ("The lawmakers in my political party are better prepared and suited to address environmental problems") than in the control group (Fig. 6; Table 1). This is one of the largest shifts exhibited by conservatives in response to the ingroup/loyalty frame. Additionally, the

change in agreement shifted Republicans from, in the control group, being slightly in disagreement to slightly in agreement with the statement.

Increased Republican agreement with this statement may not necessarily be a desirable development, as a crucial problem with climate change policy is the lack of political consensus and concerted bipartisan action. Increased Republican belief that the GOP is better able (or perhaps, the only party able) to address climate change with policy may not bode well for bipartisan climate and environmental action. Significant changes in policy are not likely to occur with greater partisan polarization on the issue. The upside, however, is that perhaps increased Republican faith in their party's ability to address environmental issues may reflect a greater desire on the part of Republicans for their party to take protective action on the environment, which in recent years has not seemed to be the case (Mildenberger et al., 2015; Pew Research Center, 2016).

Partyenv is, at its core, a question about partisan loyalty. Exposure to the ingroup/loyalty frame activates that group pride and loyalty, causing increased levels of agreement with the statement. Framing using the ingroup/loyalty foundation might have, in this case, had the unintended effect of bringing out partisan feeling in Republicans, at least as it relates to the ability of their party to address environmental problems. The shift in partyenv shows that the changes that come with reframing using moral foundations are not always anticipated or intended.

Environmental Policy Attitudes

Legend:
Party Affiliation: 1: Democrat, 2: Independent, 3: Republican
Agreement: 0: strongly disagree, 1: disagree, 2: agree, 3: strongly agree
Treatment: —— Control - - - Harm — - Ingroup

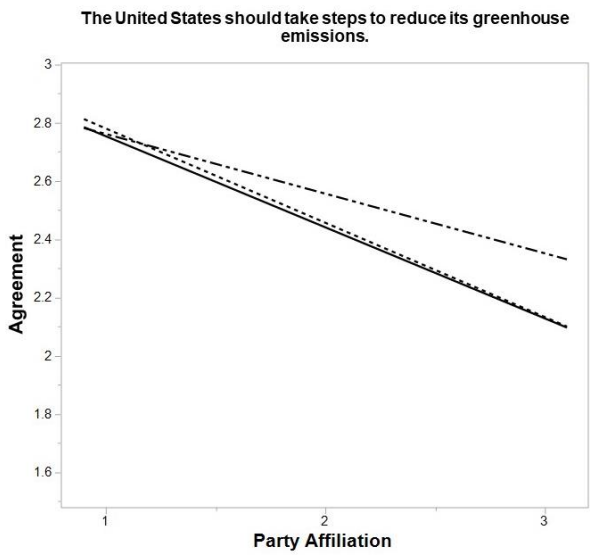


Figure 10. Levels of agreement with greenhs by political affiliation and treatment group.

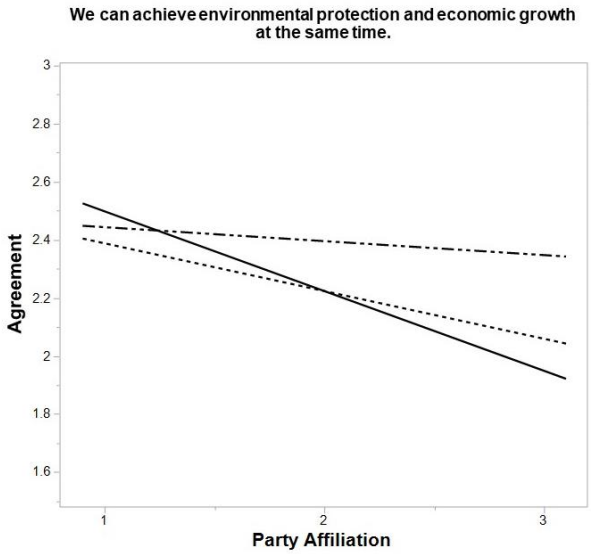


Figure 11. Levels of agreement with grwth by political affiliation and treatment group.

On two environmental policy attitudes do the Republicans in the ingroup/loyalty treatment group demonstrate higher levels of agreement: greenhs ("The United States should take steps to reduce its greenhouse emissions," +0.22) (Fig. 10, Table 1) and grwth ("We can achieve environmental protection and economic growth at the same time," +0.3) (Fig. 11, Table 1). The shift in Republican agreement with grwth in response to the ingroup/loyalty treatment virtually eliminates the gap between Democrats and Republicans.

Improvement in Republican attitudes of greenhs and grwth is beneficial to environmental and climate action. Because anthropogenic greenhouse gas emissions are the primary cause of climate change, emissions reductions are likely to be a large part of any policy action addressing

climate change (IPCC, 2014). Climate action as well as general environmental action will benefit from increasing the idea that economic growth and environmental protection might both be possible, especially because economic concerns are oft-cited reasons behind conservative opposition to environmental protection.

The modest improvements in environmental attitudes detailed above can be attributed to the efficacy of the ingroup/loyalty frame in presenting climate change and environmental issues in general in relevant conservative moral terms. Because of political polarization, without a frame, environmental causes are inherently associated with Democratic politics. With a harm/care frame, the association remains, as the typical harm/care frame does not evoke moral considerations in conservatives and is likely a partisan signal (Feinberg & Willer, 2013). However, environmental issues framed in terms of ingroup/loyalty, a moral foundation particularly relevant to conservatives, have in my study seemed to shift Republican environmental attitudes in a positive direction.

These trends fit with the body of research that indicates the potential for targeted framing to shift certain populations' viewpoints on political issues (Bain et al., 2012; Baldwin & Lammers, 2016; Daub, 2010; Hardisty et al., 2010; Kidwell et al., 2013; Schuldt et al., 2011). There is additional support for using relevant moral foundations to shift partisan stances on various political issues (Day et al., 2014; Feinberg & Willer, 2013; Kidwell et al., 2013; Wolsko et al., 2016). Conservatives seem to be more susceptible to this phenomenon, possibly because conservatives are more flexible in their political attitudes than liberals (Day et al., 2014). The trends observed in these results offer some support for the idea that framing environmental issues with a moral foundation relevant to conservatives can induce proenvironmental attitudes, as was

achieved specifically with purity framing in Feinberg & Willer (2013) and generally with binding foundation framing in Kidwell et al. (2013) and Wolsko et al. (2016).

Though the ingroup/loyalty framework did induce moderate proenvironmental shifts in some Republican attitudes, others showed no movement. Envhrm ("Environmental pollution threatens the health of my family and of my community") and comhrm ("Our children's lives will be worse because of our generation's wasteful habits") showed no increased Republican agreement after exposure to the ingroup/loyalty treatment. This was unexpected because the ingroup/loyalty argument contained a very explicit and strong emphasis on the importance of climate action in order to pass on a healthy and useful environment to one's children and future generations. The failure for any movement to show up on these variables may be because of the unrepresentative nature of the sample.

Across the board, with both Democratic and Republican participants, there were very low levels of agreement with envdgr ("Our country is in more danger from environmental hazards such as air pollution and global warming than it is from foreign military threats and terrorists"), a result which demonstrates the ability of more unpredictable, memorable, and terrifying events to dominate perceptions of future danger, over more certain and consistent outcomes. I make no claim that people *should* believe that climate change poses more of a threat than terrorism, but only observe that climate change is a more certain and reliably threatening outcome than widely devastating terrorism on any given day. Research suggests that 400,000 deaths per year are linked to the consequences of climate change, a number that is estimated to rise to 600,000 per year by 2030 (McKinnon, 2012). When factoring in health problems related to fossil fuel combustion (e.g. air pollution, occupational hazards, etc.), the death rate rises to about 5 million per year. Terrorism, on the other hand, causes an estimated 100,000 deaths per year (McKinnon, 2012).

Although the ingroup/loyalty frame served to shift some Republican policy attitudes in a proenvironmental direction, it was less successful with other environmental policy attitudes: for example, renew ("More money should be invested in research into renewable energy solutions, such as solar and wind power"). In the case of renew, the lack of movement is likely due to the fact that Republican agreement was already fairly high. Support for funding renewable energy resources is a rare point of political consensus between Democrats and Republicans – public support for funding renewables is around 90% for the general public (Pew Research Center, 2016) and 74% for Republicans (Mildenberger et al., 2015). Republicans in my sample had similar views to the national Republican population; 72% agreed that there should be more funding for renewable energy resources (Fig. 15).

For other environmental policy attitudes like poltax ("In general, I would support a tax on the pollution that causes climate change"), limited Republican movement is likely due to the unusually proenvironmental nature of Republican attitudes in this sample compared to the national Republican population. For all of the environmental policy attitudes presented, Republican attitudes were already solidly proenvironmental in every treatment. This means that Republicans in my sample, regardless of the treatment, on average agreed with morereg ("In general, I would support more stringent governmental regulations on the pollution that causes climate change") and disagreed with reghur ("Stricter environmental laws and regulations cost too many jobs and hurt the economy"). To say that it is unlikely that a national sample of Republicans would produce the same results would be a massive understatement.

Democratic Response to Treatments

Democrats exposed to the harm/care treatment did not exhibit increased proenvironmental attitudes. This runs counter to a number of studies, which have found that exposure to

proattitudinal stances framed in relevant moral foundations serve to entrench attitudes, whether they be liberal or conservative (Day et al., 2014; Hart & Nisbet, 2012; Kidwell et al., 2013). Not all show the entrenching effect, however: Feinberg & Willer (2013) observed that liberal environmental attitudes remained constant regardless of treatment group (exposure to control, harm/care, and purity framing). I posit that the lack of the entrenching effect may be because the typical language used for environmental arguments is harm/care (Feinberg & Willer, 2013). When considering environmental attitudes in the control treatment condition, participants are already viewing them in the context of harm/care framework because most environmental arguments are framed that way. Thus, exposure to a harm/care argument about climate change has no effective difference from exposure to no frame.

Nor did Democrats experience a backfire or boomerang effect when presented with the ingroup/loyalty frame, even though the ingroup/loyalty moral foundation is a less relevant, often irrelevant, foundation for liberals (Graham et al., 2009). Liberal ideological views may be more rigid than conservative ideological views, less subject to the persuasion of relevant moral foundations (Day et al., 2014). This implies that liberal and Democratic environmental attitudes are well-set enough that exposure to an irrelevant moral frame does not produce backslide in proenvironmental attitudes. Environmental views are extremely polarized, reflecting deep partisan divergences (Dunlap & McCright, 2001, 2008). The establishment of environmentalism as a concern held primarily by liberals and Democrats likely contributes to the strength and consistency of liberal and Democratic environmental attitudes, despite framing within a less relevant moral foundation.

Comparing the Sample Republicans to National Republicans

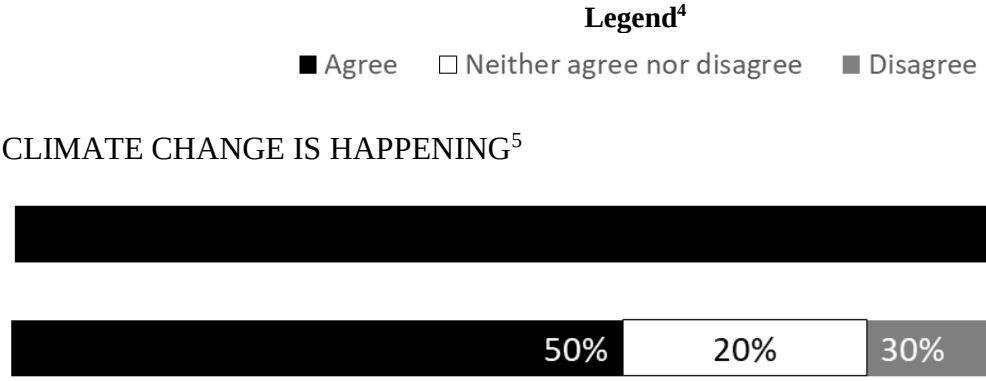


Figure 12. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

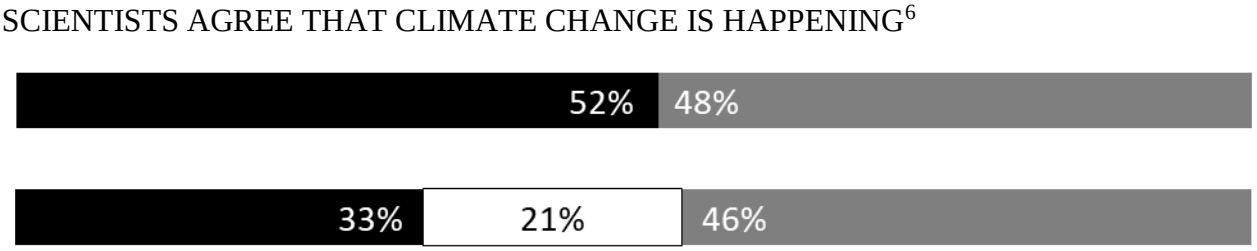


Figure 13. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

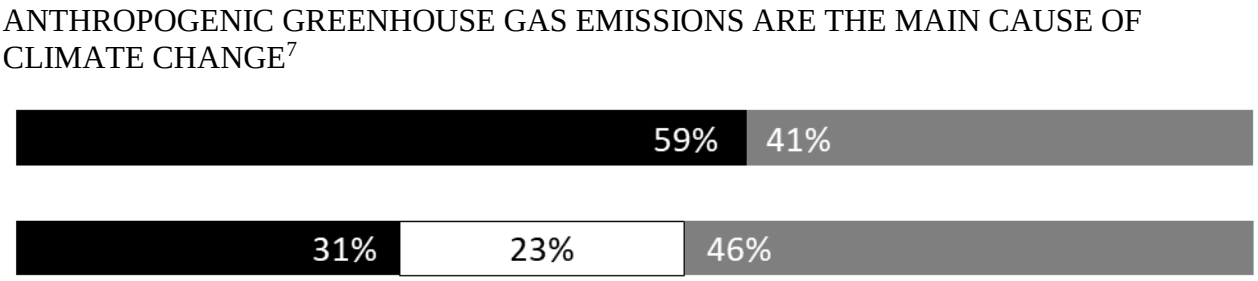


Figure 14. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

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[4] For the results of this study, the agree category consists of all participants who answered "strongly agree" or "agree," and the disagree category of all who answered "strongly disagree" or "disagree."

[5] Sample survey question wording: "I believe that climate change is happening."
Mildenberger et al. (2015) wording: "Global warming is happening."

[6] Sample survey question wording: "The majority of scientists and experts agree that climate change is happening."
Mildenberger et al. (2015) wording: "Most scientists think that global warming is happening."

[7] Sample survey question wording: "Greenhouse gas emissions (for example, from burning fossil fuels) are the primary cause of climate change."
Mildenberger et al. (2015) wording: "Global warming is caused mostly by human activities."

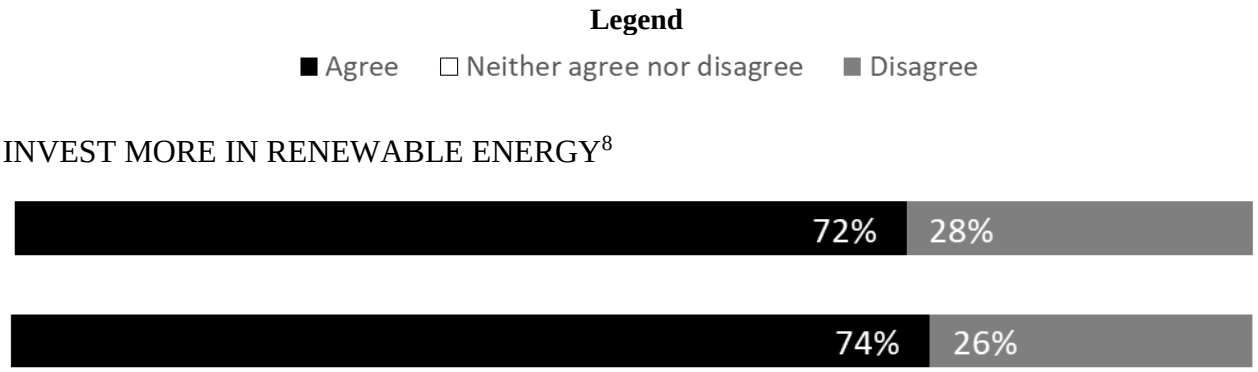


Figure 15. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

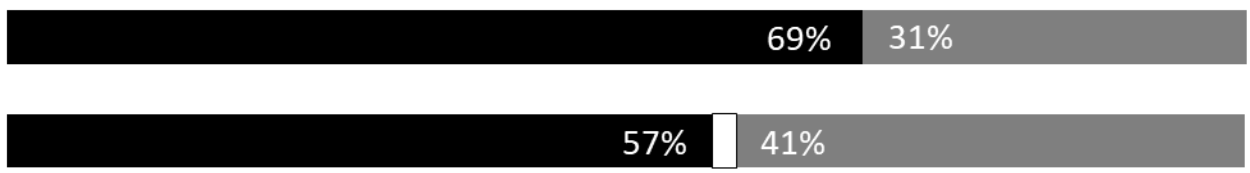


Figure 16. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

When comparing the Republican and Democratic environmental attitudes in the sample, the difference of opinion is, in almost every case but a few, simply a difference of magnitude (i.e. if Democrats strongly agree, Republicans agree; if Democrats strongly disagree, Republicans disagree – see Figs. 1, 4, and 8 for clear demonstrations of this). Any increase in proenvironmental attitudes, then, would be small and probably hidden by the noise of the data. Regardless of treatment, Republicans generally agreed with positive environmental statements, and generally disagreed with negative environmental statements. The generally proenvironmental bent of the

[8] Sample survey question wording: "More money should be invested in research into renewable energy solutions, such as solar and wind power."
Mildenberger et al. (2015) wording: We should "fund research into renewable energy sources."
[9] Sample survey question wording: "In general, I would support more stringent governmental regulations on the pollution that causes climate change."
Mildenberger et al. (2015) wording: We should "regulate CO2 as a pollutant."

Republicans in my sample means that there was not much room for Republican attitudes to shift in the first place, making finding significant results more unlikely.

There are additional reasons to believe that the Republican subset of my sample holds more and stronger proenvironmental attitudes than the general Republican population. The average environmental attitudes of the conservatives in my sample are demonstrably higher than those of the national conservative population. In an estimate of partisan public opinion on various attitudes on global warming, only 50% of registered Republicans agreed that "global warming is happening," while 30% disagreed (Mildenberger et al., 2015). Republicans in the control group of my study, on the other hand, overwhelmingly agreed (93% agree, 7% disagree) that climate change is happening (Fig. 12).[10] On the two additional measures of climate change belief, that scientists and experts agree that climate change is happening, and that anthropogenic greenhouse gas emissions is the main cause of climate change, Republicans in the control group of my study exhibit higher levels of agreement. Over half agree with both statements; 52% agree (48% disagree) that the scientific consensus is robust and 59% agree (41% disagree) that anthropogenic greenhouse gas emissions cause climate change, as opposed to 33% (46% disagree) and 31% (46% disagree) of Republicans nationally, respectively (Mildenberger et al., 2015; Figs. 13 and 14).

[10] Although the wording is slightly different (climate change vs. global warming), I hold the comparison of results as valid. Some researchers have found that using the term climate change increases conservative belief (by about 16%) relative to using global warming (Schuldt et al., 2011). Regardless, the gap between 93% agreement and 50% agreement is large enough that it is unlikely to be explained by a simple difference in wording, and is more likely a result of the conservatives in my sample holding what would be considered more liberal environmental attitudes. I use the term climate change rather than global warming because it is the convention in the scientific community and is a more encompassing term for the changes that will occur as a result of increased atmospheric greenhouse gas concentrations.

Two environmental policy attitudes that this study measured happen to match up fairly well[11] with attitudes that Mildenberger et al. (2015) measure, providing further comparison between the Republicans in this sample and those in the general population. Stances on investing in renewable energy sources are generally similar between the Republicans in the control group of my sample and those in the general population: 72% of my sample support funding renewables (with 28% not supporting) and 74% of national Republicans support funding renewables (with 26% not supporting) (Fig. 15). While only 57% of the general Republican population agrees that the pollution that causes climate change should be regulated (with 41% disagreeing), 69% of Republicans in this sample agree (with 31% disagreeing) (Fig. 16).

The American Environmental Values Survey measured various environmental attitudes in American citizens, in some cases separating out Republican and Democratic participants. The 2006 survey measured agreement with two statements that correlate with two attitudes I measured. The authors found that 32% of their Republican respondents agreed with the statement "Our country is in more danger from environmental hazards such as air pollution and global warming than it is from foreign military threats and terrorists" (ecoAmerica, 2006). The report did not include the percentage who disagreed. Of the conservatives in the control group of my sample, however, only 17% agreed (with 83% disagreeing).

Overall, there is strong evidence that the Republicans in this sample are not representative of the general Republican population. These Republicans hold more proenvironmental attitudes than the average Republican. Due to this fact, the possibility for movement of Republican environmental attitudes as a result of treatment condition is narrower than it would be in a national

[11] Because the wording of my survey questions are slightly different than what Mildenberger et al. (2015) estimate, the comparison may not be as precise as desired. The point, however, is not to estimate the exact difference, but to emphasize that the difference between the Republican sample and the general Republican population exists and is likely meaningful in the context of the results of this study. For exact wording, see footnotes 5-9 on pages 42-43.

sample. It is likely that the trends observed in this sample would be amplified in national sample, or if the Republicans in this sample were more representative of the general Republican population.

Confounding Factors

Given that the participants were drawn from a pool of undergraduate college students, the ability to draw firm conclusions is limited. A sample of college undergraduates is not able to represent the general population perfectly; this sample of students was higher income, more diverse, of higher educational attainment, of a narrow age cohort, and more liberal than the general population.

As mentioned during the discussion of the Republican shift in agreement that it is important to protect the environment from harm (envprt), the ingroup/loyalty argument did include an element of harm/care, insofar as it argued that climate change poses a threat to the strength of American communities and the integrity of the environment left behind for descendants, and that acting to protect the environment is a way to protect one's ingroup. The inclusion of the harm/care moral foundation in the ingroup/loyalty could potentially have been a confounding factor.

Furthermore, there is an element of social distance within the two treatments, which may have also introduced some variability. The harm/care treatment speaks about harm to global human life and property, while the ingroup/loyalty implicitly focuses more on local communities. The ingroup/loyalty frame also twice mentions rural communities specifically – this was overlooked. The specification of rural communities in the frame may explain why there was no movement in particular attitudes that relate to the threat that environmental problems pose to the community; there is a possibility that the frame could have resonated less for Republicans who do not feel particularly connected to rural communities.

Further Research

A general, consistent pattern exists in the data: that exposure to an ingroup/loyalty framing of environmental action shifted Republican attitudes in a proenvironmental direction. These results supports previous research that strategically using relevant moral foundations to frame counter-attitudinal stances can shift conservative stances on a variety of political issues (Day et al., 2014), including environmental issues (Feinberg & Willer, 2013; Kidwell et al., 2013; Wolsko et al., 2016). However, due to the nature of this sample, concrete conclusions cannot be drawn. Replication of this study with a national sample would provide a representative Republican sample and would allow researchers to determine whether the qualitative trends described in this paper are valid.

Conclusion

The country now faces and will face in the future many environmental problems. Many of these issues, including climate change, are complex, widespread in their effects, and dangerous to human economic success, health and survival, and security. Due to their complexity, collective policy action to effectively address these environmental problems is required. Yet although there is a scientific consensus on the consequences that the world will face as a result, there is no political consensus on the need to address environmental problems, nor on the existence of some of those problems in the first place.

Policymakers cannot effectively act on climate change if both the elites and the rank-in-file members of one of the two major parties either deny that a problem should be addressed or that it exists in the first place. As climate change progresses further, its effects will be felt both by Republican and Democratic areas – certain consequences, such as increasing occurrence and intensity of droughts and heat waves that threaten agricultural productivity, will mainly affect heavily Republican areas more than Democratic areas. Others, such as rising sea level that will flood sections of coastal cities and displace residents, will mainly affect heavily Democratic areas. The ability of the country and our policy to adapt to climate change is not complete without Republican buy in and participation. Thus, GOP lawmakers require strategies that allow them to communicate with their constituents about environmental policy without alienating them. Some conservative lawmakers and environmental advocates are doing this already, using arguments for conservation and climate action that fit with conservative principles and values (Tabuchi, 2017). Moral Foundations Theory can inform these efforts, illuminating people's motivations, which are so often rooted in moral values, and providing more effective strategies for communication.

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Appendices

Appendix A: Summary of Moral Foundations Language

Moral Frame	Description	Related Moral Language
Harm/Care	Caring for others and alleviating suffering	safe*, peace*, compassion*, empath*, sympath*, care, caring, protect*, shield, shelter, amity, secur*, benefit*, defen*, guard*, preserve, harm*, suffer*, war, wars, warl*, warring, fight*, violen*, hurt*, kill, kills, killer*, killed, killing, endanger*, cruel*, brutal*, abuse*, damag*, ruin*, ravage, detriment*, crush*, attack*, annihilate*, destroy, stomp, abandon*, spurn, impair, exploit, exploits, exploited, exploiting, wound
Fairness/Reciprocity	Ensuring just and fair outcomes for people	fair, fairly, fairness, fair*, fairmind*, fairplay, equal*, justice, justness, justifi*, reciproc*, impartial*, egalitar*, rights, equity, evenness, equivalent, unbias*, tolerant, equable, balance*, homologous, unprejudice*, reasonable, constant, honest*, unfair*, unequal*, bias*, unjust*, injust*, bigot*, discriminat*, disproportion*, inequitable, prejud*, dishonest, unscrupulous, dissociate, preference, favoritism, segregat*, exclusion, exclud*
Ingroup/Loyalty	Respecting hierarchy and tradition	together, nation , homeland*, family, families, familial, group, loyal*, patriot*, communal, commune*, communit*, communis*, comrad*, cadre, collectiv*, joint, unison, unite*, fellow*, guild, solidarity, devot*, member, cliqu*, cohort, ally, insider, foreign*, enem*, betray*, treason*, traitor*, treacher*, disloyal*, individual*, apostasy, apostate, deserted, deserter*, deserting, deceiv*, jilt*, imposter, miscreant, spy, sequester, renegade, terroris*, immigra*
Authority/Tradition	Loyalty to one's group	obey*, obedien*, duty, law, lawful*, legal*, duti*, honor*, respect, respectful*, respected, respects, order*, father*, mother, motherl*, mothering, mothers, tradition*, hierarch*, authorit*, permit, permission, status*, rank*, leader*, class, bourgeoisie, caste*, position, complian*, command, supremacy, control, submi*, allegian*, serve, abide, defere*, defer, revere*, venerat*, comply, defian*, rebel*, dissent*, subver*, disrespect*, disobe*, sediti*, agitat*, insubordinat*, illegal*, lawless*, insurgent, mutinous,

		defy*, dissident, unfaithful, alienate, defector, heretic*, nonconformist, oppose, protest, refuse, denounce, remonstrate, riot*, obstruct
Purity/Sanctity	Valuing purity and the sacredness of the divine	piety, pious, purity, pure*, clean*, steril*, sacred*, chast*, holy, holiness, saint*, wholesome*, celiba*, abstention, virgin, virgins, virginity, virginal, austerity, integrity, modesty, abstinen*, abstemiousness, upright, limpid, unadulterated, maiden, virtuous, refined, intemperate, decen*, immaculate, innocent, pristine, humble, disgust , deprav*, disease*, unclean*, contagio*, indecen*, sin, sinful*, sinner*, sins, sinned, sinning, slut*, whore, dirt*, impiety, impious, profan*, gross, repuls*, sick*, promiscu*, lewd*, adulter*, debauche*, defile*, tramp, prostitut*, unchaste, wanton, profligate, filth*, trashy, obscen*, lax, taint*, stain*, tarnish*, debase , desecrat*, wicked*, blemish, exploitat*, pervert, wretched

(Graham et al., 2009)

Appendix B: Summary of Experimental Treatments

Treatment	Moral Framework	Argument Summary	Language Used
Control	–	–	–
Treatment 1	Ingroup/Loyalty	- Community responsibility to manage environmental stewardship - Effects of climate change on local communities - Responsibility to pass on a good environmental legacy to one's children - Environmental action as a fulfillment of shared ideals and values	(grand)children legacy our family/families local future generations community betray* shared ideals/values
Treatment 2	Harm/Care	- Need to protect the world from environmental harm - Focus on harm posed to human health, life, and livelihood - Protecting and preserving our environment	harm preserv* defend integrity safe* threaten* endanger* protect* ruin*

Adapted from Graham et al., 2009.

Appendix C: Treatments

Treatment 1: Harm/Care

SJR
The State Journal-Register

State Representative Calls for Global Environmental Action

When State Representative Todd Barkley met with citizens at a town hall on Saturday, he came with a message: lawmakers need to address the harm that human beings have done to the global environment.

"This is the only planet we have, and we must preserve and defend the integrity of our natural world," said Barkley. "The health and safety of human beings everywhere depends on effective and immediate climate action."

Barkley emphasized how climate change threatens countless communities around the world. "In recent years, we have seen global temperatures rise to record levels. This has caused Arctic ice to melt and sea levels to rise," said Barkley. "Coastal areas have been uniquely affected by rising sea levels. People are being forced to leave their homes and move to crowded inland areas." He noted that rising global temperatures also increase the frequency of devastating tropical storms, such as hurricanes and monsoons. "The lives of coastal area residents worldwide are endangered due to climate change."

Barkley focused most of his remarks on how climate change will harm humans in nearly every part of the world. However, he also expressed optimism that the global community could respond to these challenges. "Our world faces now and will face harsh realities: declining air and water quality, more frequent extreme weather events, rising sea levels, and more," Barkley told his audience. "Yet we have the capability to meet these challenges head on, and protect and preserve our global environment. A failure to do so would have ruinous consequences for all of humanity."

Treatment 2: Ingroup/Loyalty



State Representative Calls for Local Environmental Action

When State Representative Todd Barkley met with citizens at a town hall on Saturday, he came with a message: Illinois lawmakers need to address environmental issues affecting their local communities.

"We know that the earth is not inherited from our ancestors, but borrowed from our children," said Barkley. "It is our most important duty to leave a healthy environmental legacy for our families."

Barkley emphasized how local environmental issues are connected to the broader impacts of a changing climate. "In recent years, we have experienced heat waves much more often than we did in the past. This kind of long-term change in the climate threatens the growth of crops that are vital to the prosperity of farmers in rural areas around the state. If damage to crops continues, it could affect the food supply and economic well-being of future generations--our children, our grandchildren."

Barkley focused most of his remarks on how climate change will create problems for rural communities and future generations of citizens. However he also expressed optimism that citizens of Illinois could respond to these challenges. "Our home now faces and will continue to face harsh realities: declining air and water quality, more frequent heat waves and extreme weather events, less favorable agricultural conditions, and more," Barkley told local citizens. "Yet we can come together as a community to protect our natural resources and our local environment for future generations. A refusal to pursue community-minded solutions would be a betrayal to our shared ideals and values."

Appendix D: List of Dependent Variables Measured

Climate Change Attitudes	
climchg1	I believe that climate change is happening.
climchg2	The majority of scientists and experts agree that climate change is happening.
climchg3	Greenhouse gas emissions (for example, from burning fossil fuels) are the primary cause of climate change.
General Environmental Attitudes	
hrmexag	The current environmental crisis has been greatly exaggerated.
envtoof	The country has gone too far in its efforts to protect the environment.
envprog	Pollution is a small price to pay for progress.
envprt	It is important to protect the environment from harm.
envcost	The costs of not addressing environmental problems are much higher than the costs of addressing the environmental problems.
envdgr	Our country is in more danger from environmental hazards such as air pollution and global warming than it is from foreign military threats and terrorists.
envhrm	Our children's lives will be worse because of our generation's wasteful habits.
envgod	Taking good care of nature is part of our duty to God.
comhrm	Environmental pollution threatens the health of my family and of my community.
clrsol	There are clear solutions to environmental issues facing the country.
Environmental Governance Attitudes	
fedleg	The federal government should produce legislation aimed at protecting the environment.
fedurb	The federal government should be doing more to mitigate the effects of climate change on urban communities.
fedrrl	The federal government should be doing more to mitigate the effects of climate change on rural communities.
staturb	State governments should be doing more to mitigate the effects of climate change on urban communities.
statrrl	State governments should be doing more to mitigate the effects of climate change on rural communities.
privenv	Private companies should be doing more to protect the environment.
citenv	Private citizens should be doing more to protect the environment.
bipart	There should be bipartisan action to address environmental issues.
partyenv	The lawmakers in my political party are better prepared and suited to address environmental problems.

Environmental Policy Attitudes	
reghur	Stricter environmental laws and regulations cost too many jobs and hurt the economy.
grwth	We can achieve environmental protection and economic growth at the same time.
indprop	Environmental regulations infringe too much on individual property rights.
greenhs	The United States should take steps to reduce its greenhouse emissions.
poltax	In general, I would support a tax on the pollution that causes climate change.
morereg	In general, I would support more stringent governmental regulations on the pollution that causes climate change.
renew	More money should be invested in research into renewable energy solutions, such as solar and wind power.

Appendix E: Large Results Graphs for Easier Viewing

Legend:
Party Affiliation: 1: Democrat, 2: Independent, 3: Republican
Agreement: 0: strongly disagree, 1: disagree, 2: agree, 3: strongly agree
Treatment: Control Harm Ingroup

CLIMATE CHANGE ATTITUDES

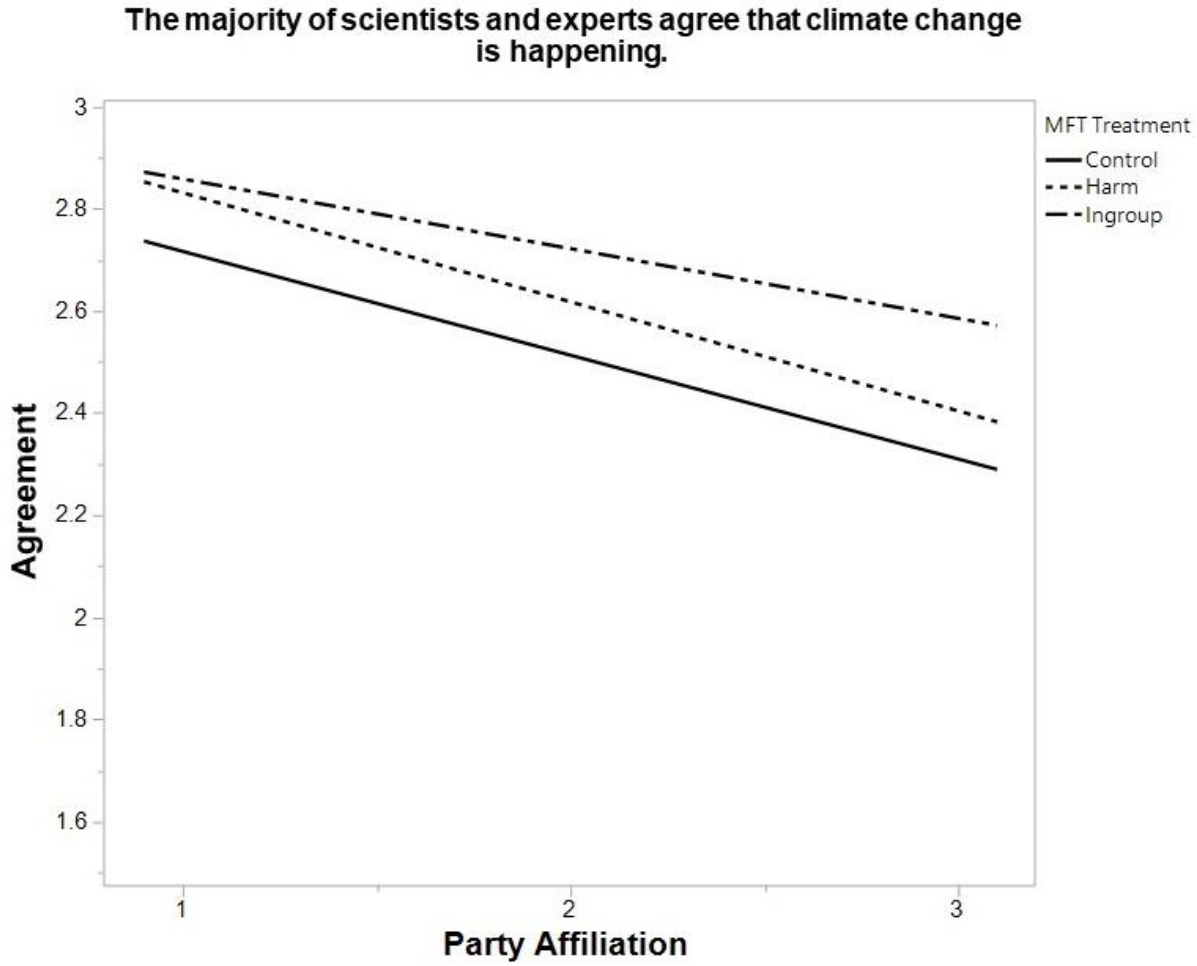


Figure 1. Levels of agreement with climchg2 by political affiliation and treatment group.

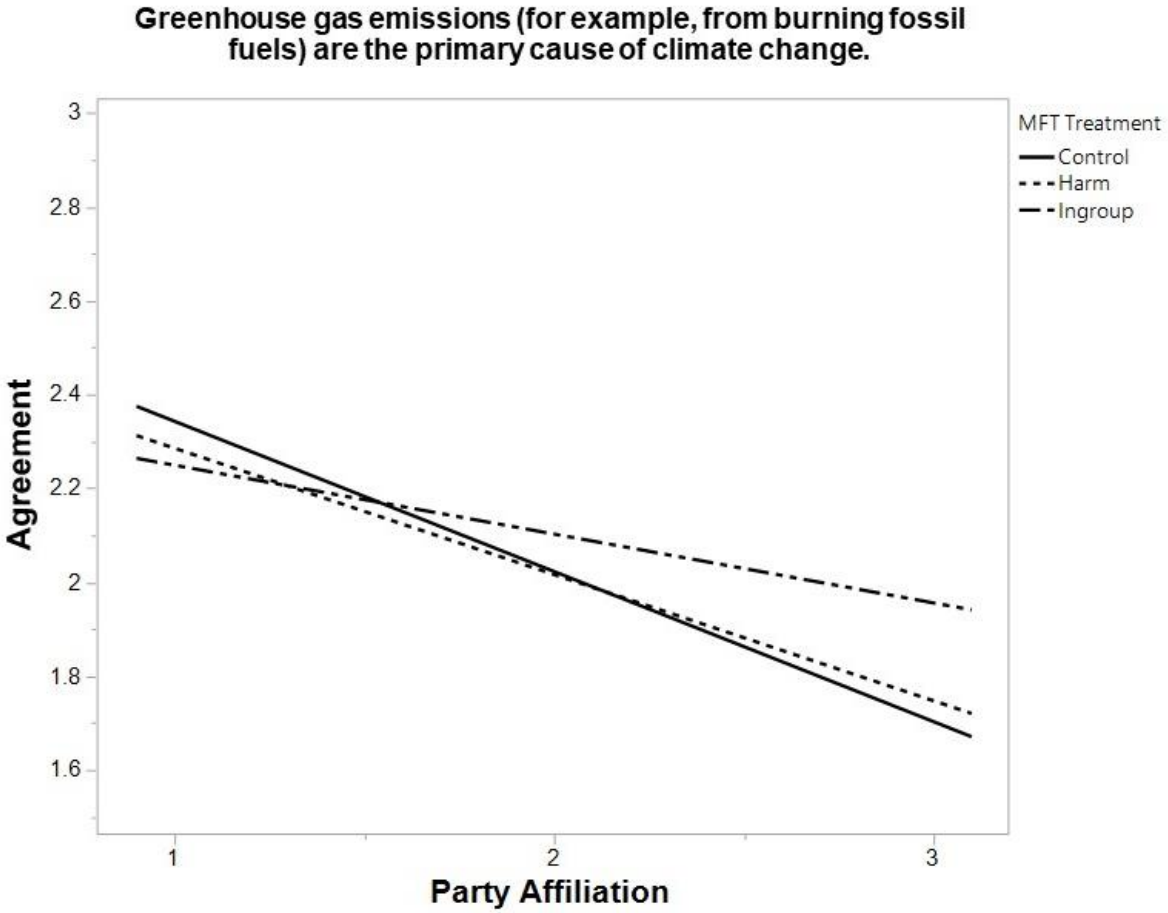


Figure 2. Levels of agreement with climchg3 by political affiliation and treatment group.

GENERAL ENVIRONMENTAL ATTITUDES

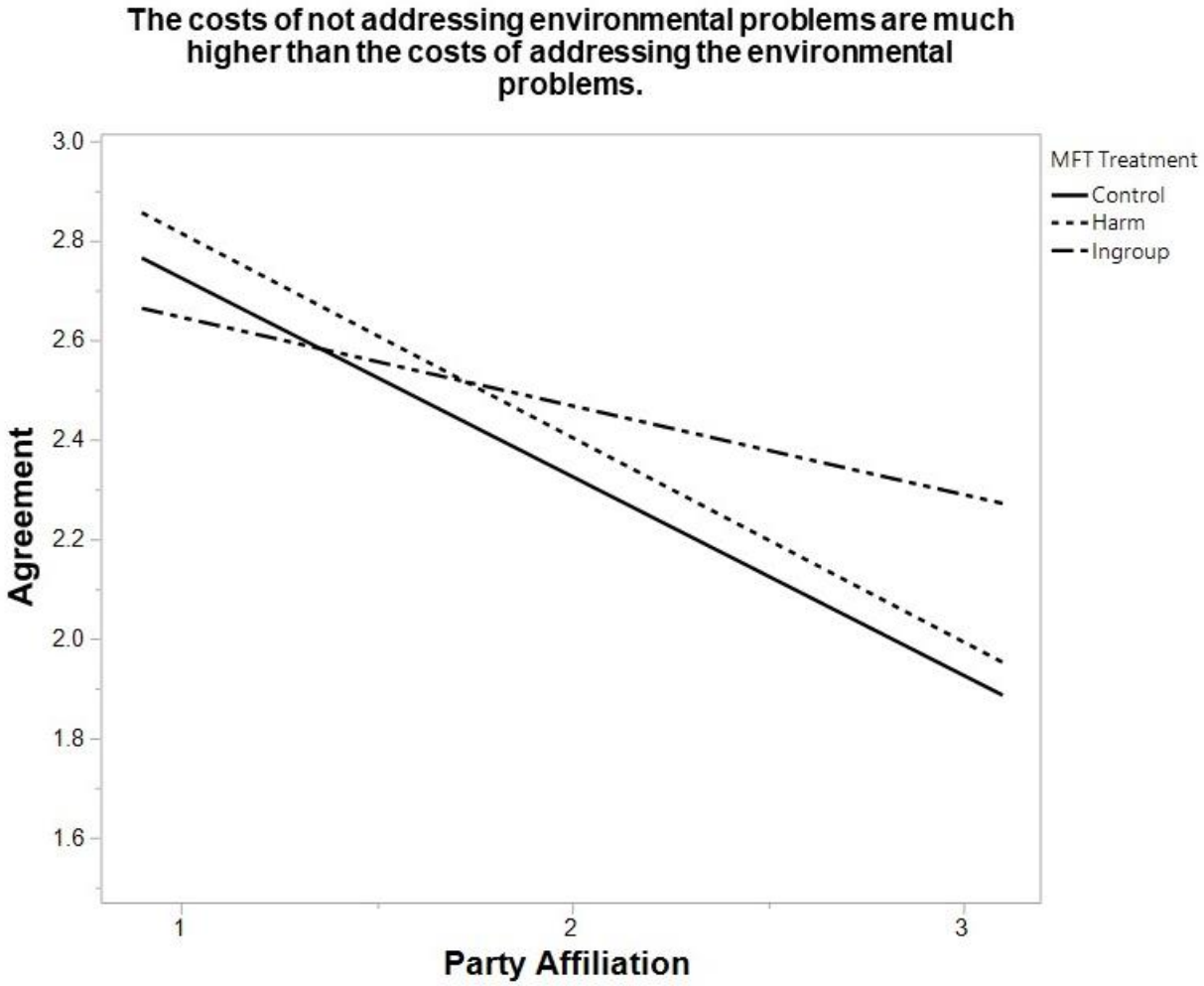


Figure 3. Levels of agreement with envcost by political affiliation and treatment group.

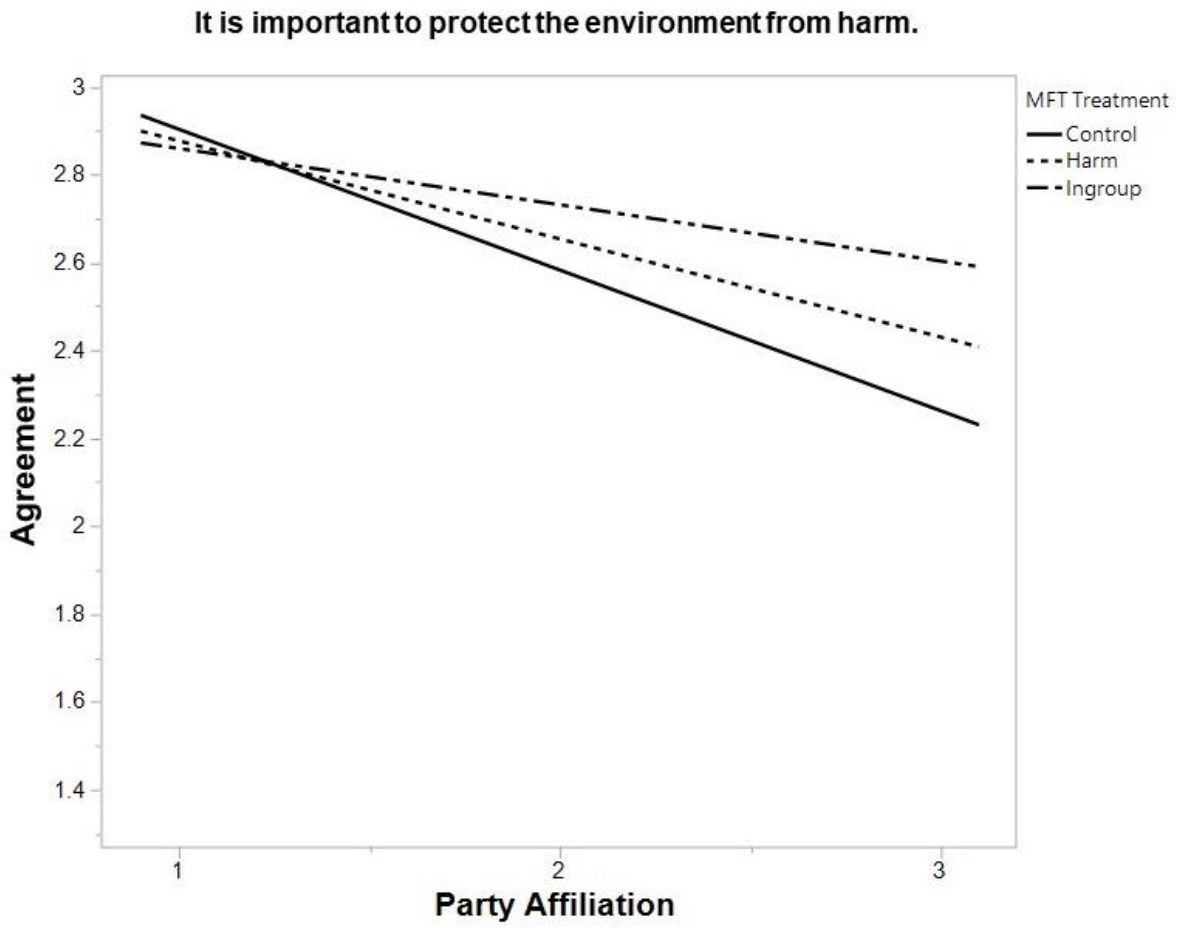


Figure 4. Levels of agreement with envprt by political affiliation and treatment group.

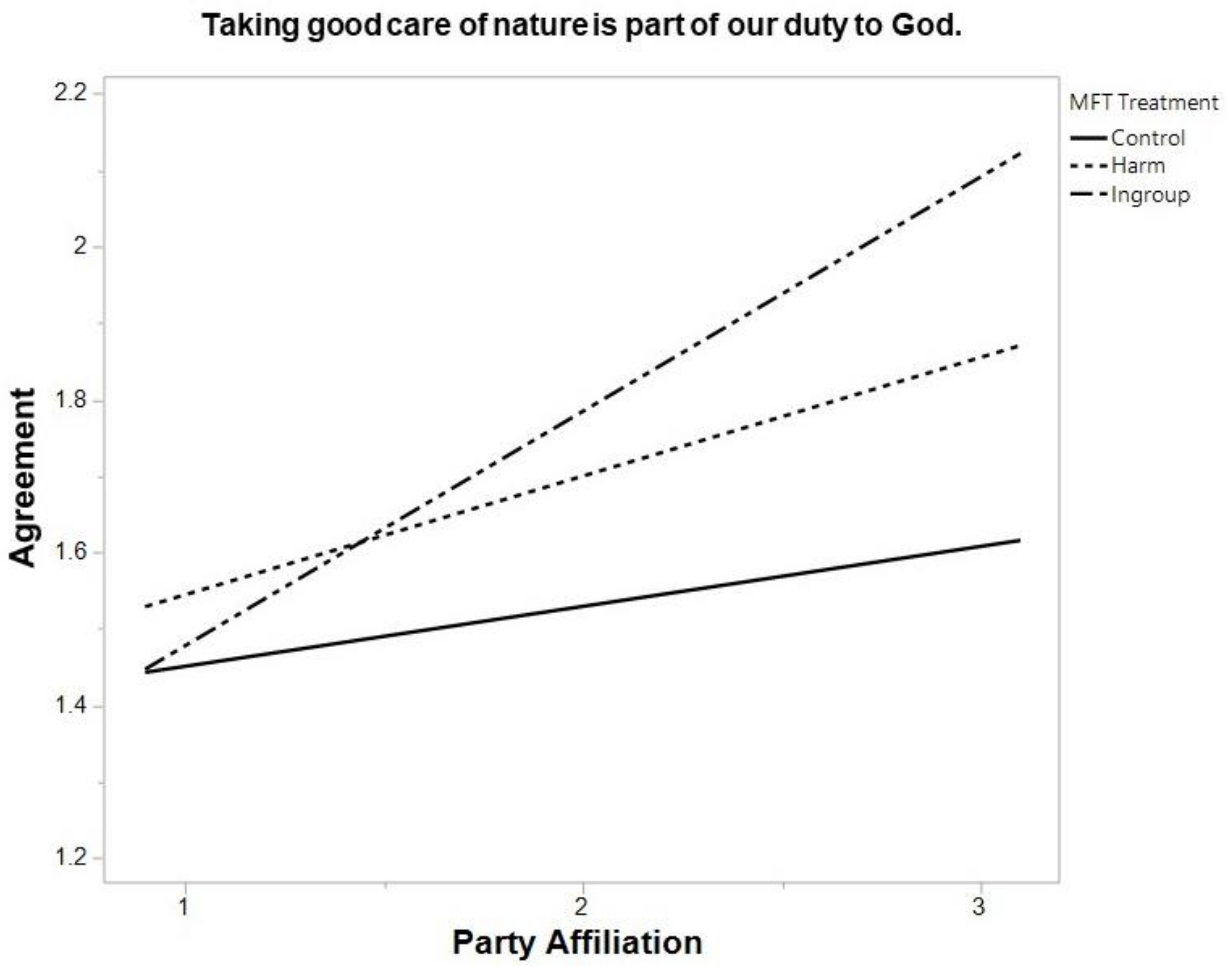


Figure 5. Levels of agreement with envgod by political affiliation and treatment group. (Note the different scale.)

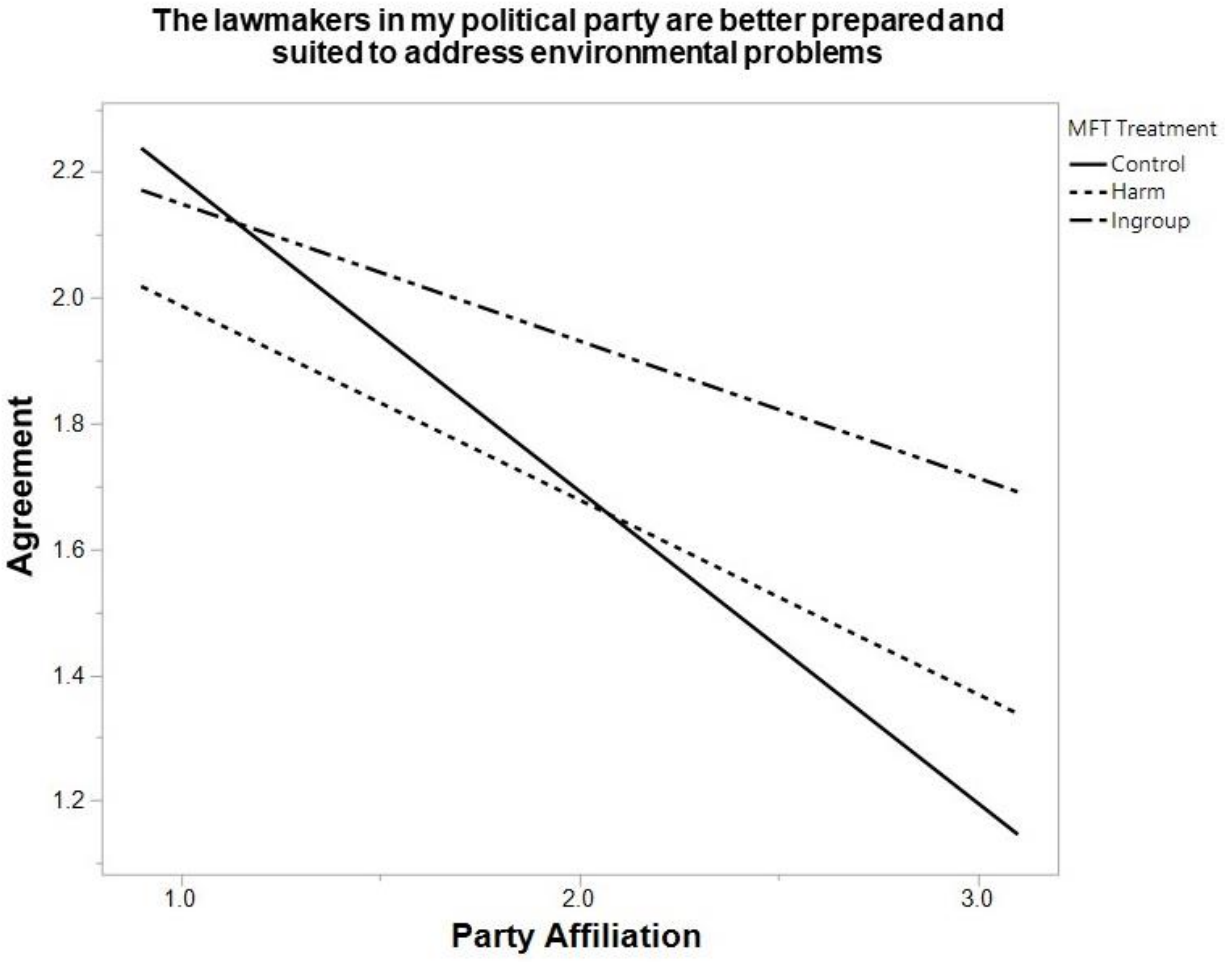


Figure 6. Levels of agreement with partyenv by political affiliation and treatment group. (Note the different scale.)

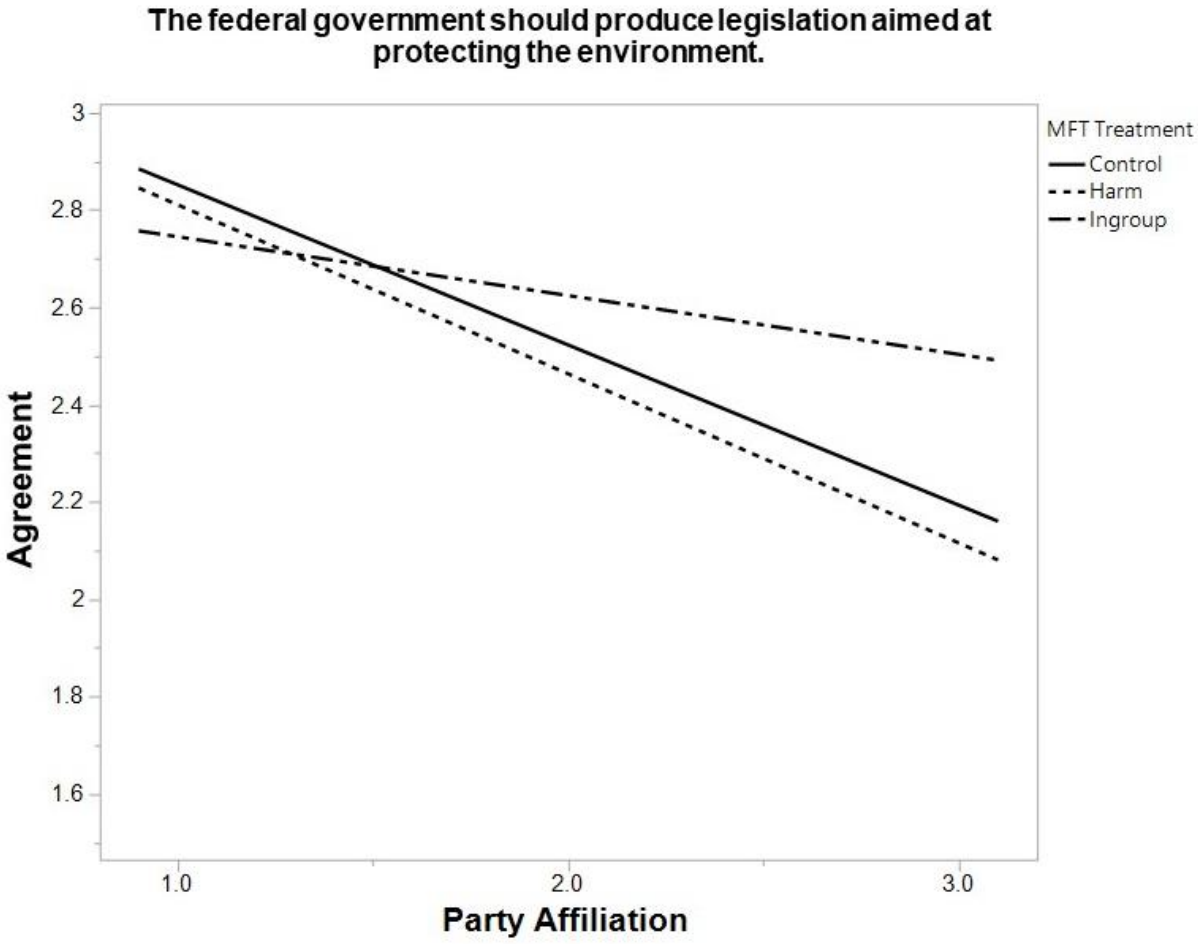


Figure 7. Levels of agreement with fedleg by political affiliation and treatment group.

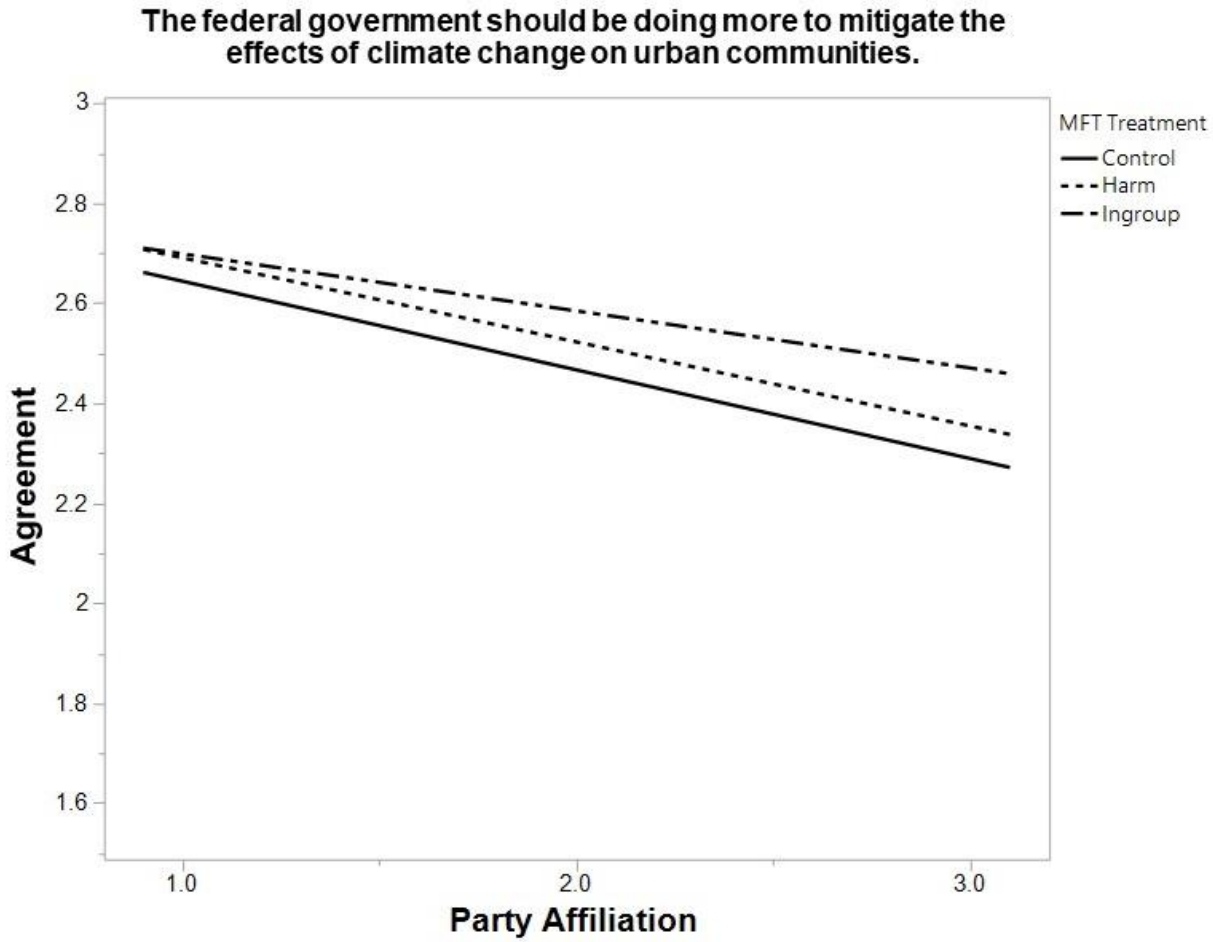


Figure 8. Levels of agreement with fedurb by political affiliation and treatment group.

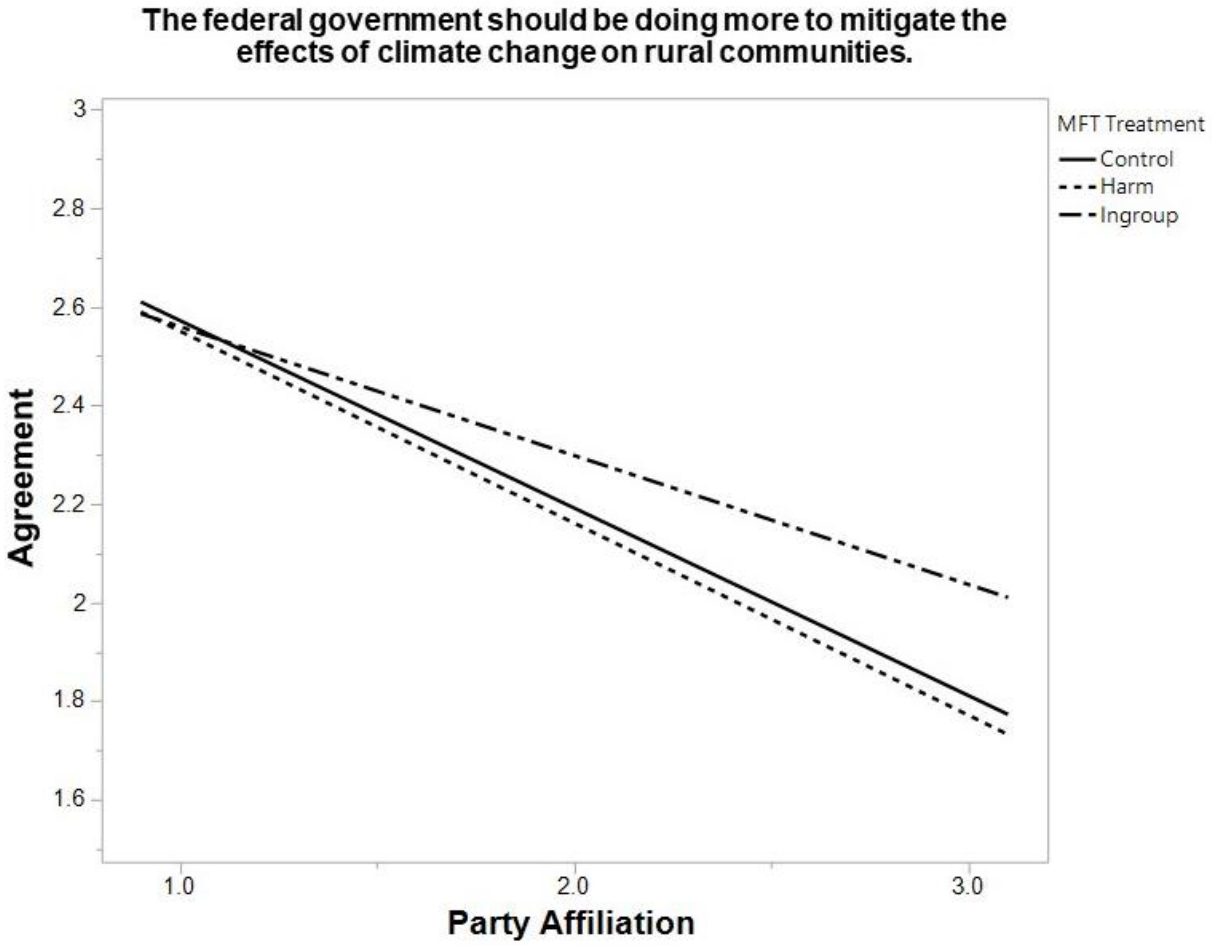


Figure 9. Levels of agreement with fedrrl by political affiliation and treatment group.

ENVIRONMENTAL POLICY ATTITUDES

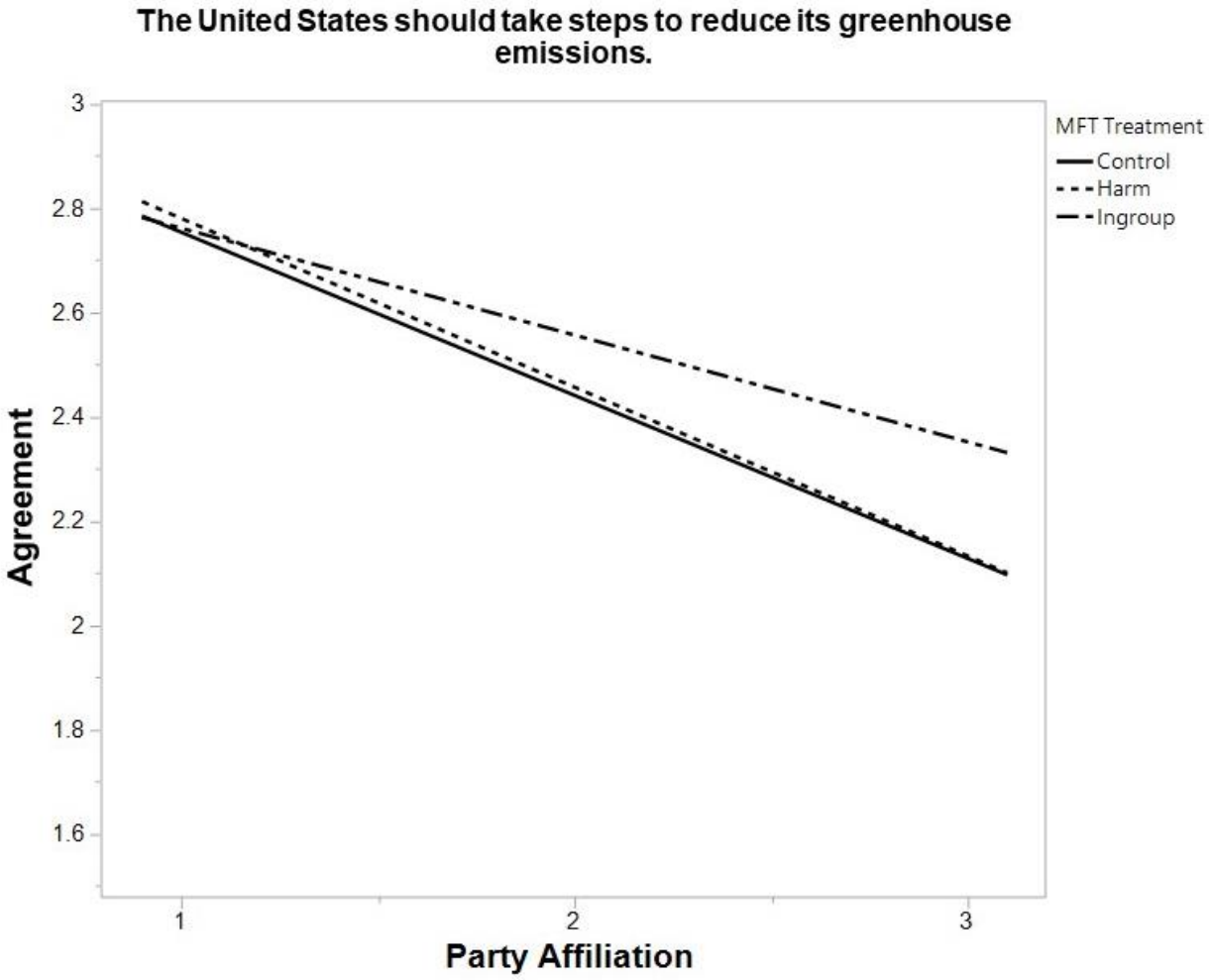


Figure 10. Levels of agreement with greenhs by political affiliation and treatment group.

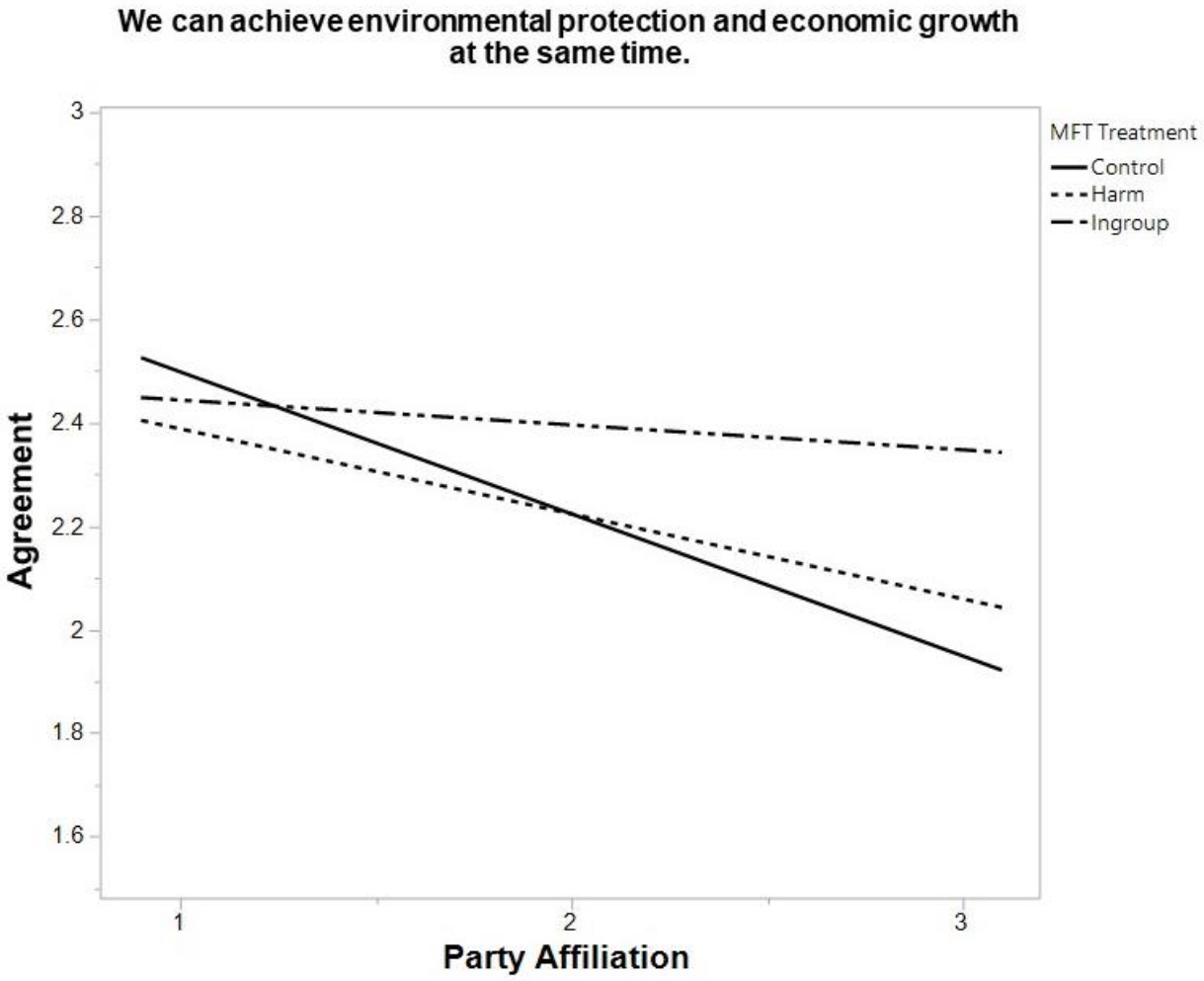


Figure 11. Levels of agreement with grwth by political affiliation and treatment group.

COMPARISON OF SAMPLE REPUBLICANS AND NATIONAL REPUBLICANS

Legend[12]



CLIMATE CHANGE IS HAPPENING[13]



Figure 12. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

SCIENTISTS AGREE THAT CLIMATE CHANGE IS HAPPENING[14]

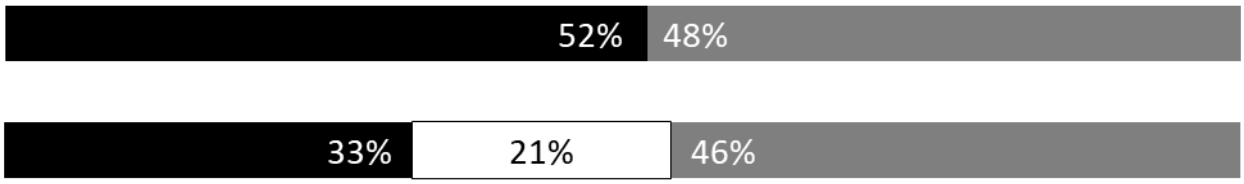


Figure 13. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

ANTHROPOGENIC GREENHOUSE GAS EMISSIONS ARE THE MAIN CAUSE OF CLIMATE CHANGE[15]

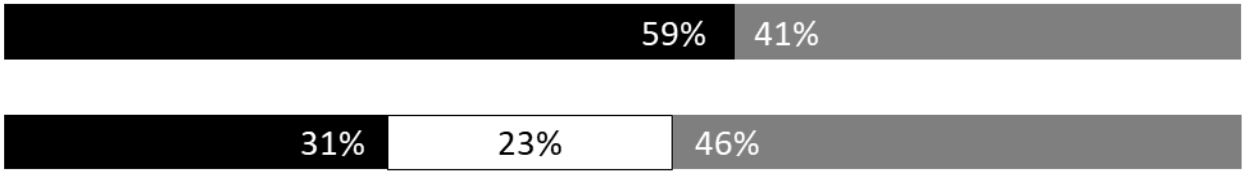


Figure 14. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

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[12] For the results of this study, the agree category consists of all participants who answered "strongly agree" or "agree," and the disagree category of all who answered "strongly disagree" or "disagree."

[13] Sample survey question wording: "I believe that climate change is happening."
Mildenberger et al. (2015) wording: "Global warming is happening."

[14] Sample survey question wording: "The majority of scientists and experts agree that climate change is happening."
Mildenberger et al. (2015) wording: "Most scientists think that global warming is happening."

[15] Sample survey question wording: "Greenhouse gas emissions (for example, from burning fossil fuels) are the primary cause of climate change."
Mildenberger et al. (2015) wording: "Global warming is caused mostly by human activities."

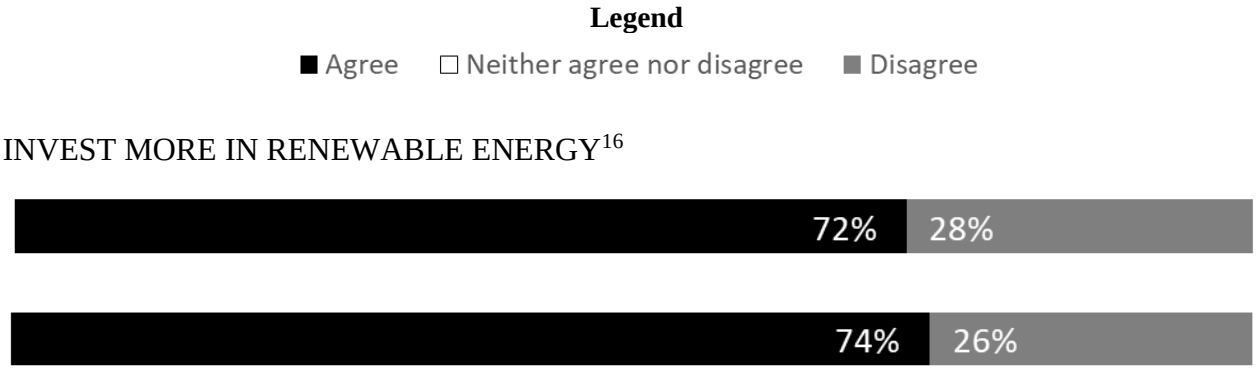


Figure 15. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

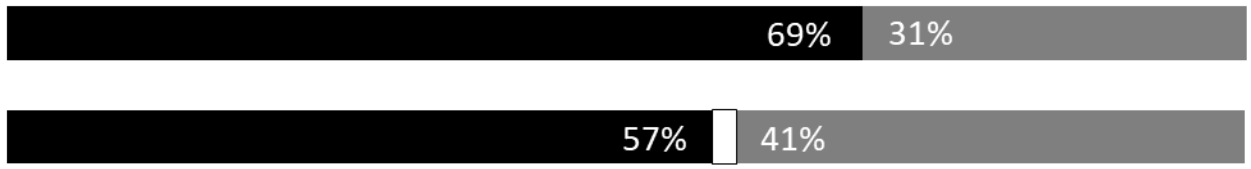


Figure 16. Comparison of sample Republican attitudes (top) with national Republican attitudes (bottom; Mildenberger et al., 2015).

[16] Sample survey question wording: "More money should be invested in research into renewable energy solutions, such as solar and wind power."
Mildenberger et al. (2015) wording: We should "fund research into renewable energy sources."
[17] Sample survey question wording: "In general, I would support more stringent governmental regulations on the pollution that causes climate change."
Mildenberger et al. (2015) wording: We should "regulate CO2 as a pollutant."