

# **A Summary Report on Persuading the Public about Climate Change Using Media and Corporate Sources**

Jonathan J. Pierce, Megan Hillyard, Remington Purnell, and Alissa Neuman  
Seattle University  
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## **Abstract**

This research evaluates the effectiveness of various conservative and liberal media and corporate statements to persuade the public about climate change in comparison to scientific statements. To achieve this purpose an experimental survey of the US public was conducted in March 2017. Respondents were randomly assigned one of five texts about climate change. Each text argues that mostly human activities are causing climate change, except for one that suggests climate change is a conspiracy by the conservative leaning *Washington Times*. After reading the text, respondents were asked to complete a survey on their beliefs about the causes of climate change, their level of concern or perceived risk, and whether the US should reduce greenhouse gas emissions. Each text was compared to a scientific statement to determine its relative level of persuasiveness. The results reveal that texts are not more persuasive than a scientific statement. However, the text arguing a conspiracy theory about climate change had a negative effect on respondents' belief that climate change is mostly caused by humans in comparison to those that read the scientific statement. This was found among all respondents, only conservatives, and only liberals. The results are summarized below.

**Result 1:** Current attempts using texts to persuade the public about the causes of climate change are not more persuasive than scientific statements. This includes attempts in the media such as liberal sources targeting liberals, and conservative sources targeting conservatives.

**Result 2:** There is a clear division in beliefs based on political ideology. Regardless of text read, about 90% of liberal respondents believe in human causes of climate change, are at least somewhat worried, and support US reduction of greenhouse gas emissions. Among conservative respondents, regardless of text read, about 50% believe in human causes of climate change, and are at least somewhat worried. However, support for the US reduction of greenhouse gas emissions despite other countries' position is much higher, about 70% support. These results indicate that after reading about climate change, conservative support for public policies reducing greenhouse gas emissions is higher in comparison to other beliefs. Therefore, it may be easier to persuade conservatives to support climate change mitigating policies than it is to persuade them to believe in the mostly human causes of climate change or perceive it as a risk.

**Result 3:** A conspiracy text that questions the science and validity of climate change significantly increases skepticism about the human causes of climate change among both conservatives and liberals. Therefore, conspiracy may be an effective strategy to also increase agreement about climate change, but further research is necessary.

## **Acknowledgements**

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For questions, comments, concerns, or feedback regarding this survey and research project please contact the following:

Jonathan J. Pierce  
Assistant Professor  
Institute of Public Service  
Seattle University  
[piercejo@seattleu.edu](mailto:piercejo@seattleu.edu)

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## Executive Summary

This report presents the findings of an experimental survey conducted in March 2017. The purpose of this experiment was to evaluate the effects of media and open sources that represent a wide variation in arguments about climate change. The research was designed to explore the influence of various texts on beliefs about climate change in comparison to a control group that read a series of scientific statements about climate change from the Intergovernmental Panel on Climate Change (IPCC). The analysis focuses on comparing the texts to the control, not to each other. This objective addresses the research purpose of assessing whether current attempts of using texts to persuade the general public about climate change are more effective than scientific statements. After reading a text, respondents were asked a series of questions about global warming.<sup>1</sup>

Five texts are selected for this study. They are not edited because the purpose of this research is to explore the effect of the text in its entirety and original form. The first text is a series of scientific statements taken from the IPCC's "Climate Change 2014 Synthesis Report Summary for Policymakers". The results of this text are the baseline for comparison to other texts. The second text analyzed is a *Wall Street Journal* opinion-editorial by Republican political officials targeting Republicans arguing for a government regulated carbon tax to address the human causes of climate change. The third text analyzed is also from a conservative leaning newspaper – *The Washington Times*. This text is an editorial from the *Washington Times* that argues climate change is a conspiracy as the Obama Administration colluded with climate scientists to select data persuade the public about the mostly human causes of climate change. The fourth text is also from a conservative leaning source, but instead from the media it is a statement taken directly from ExxonMobil's website. It is their official corporate statement on climate change that acknowledges humans are causing climate change and need to regulate and limit the release of greenhouse gas emissions. The final text is from a liberal leaning source. It is an editorial in *The New Yorker* from environmentalist and founder of 350.org, Bill McKibben, that targets ExxonMobil as a main cause of climate change.

After reading a text, respondents answered questions about global warming that were related to cause, level of concern, and US policy. Overall, there are no positive associations between reading a text about climate change and beliefs about its causes, level of concern, or policy position in comparison to reading a scientific statement. However, reading the conspiracy text *Washington Times* for all respondents reveals a negative association with the belief that human activities cause climate change in comparison to a scientific statement.

The paper is organized as follows: survey methodology and demographics of respondents; a table comparing the attributes of the four texts; the results organized by text and reporting results among all respondents, all conservatives, and all liberals; a discussion about the results; and an Appendix including all five texts.

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<sup>1</sup> The survey used the term global warming because this is consistent with current Gallup poll research as well as research by the Yale Program on Climate Change Communication which the survey questions were based on, <http://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/>

## Survey Methodology and Demographic Characteristics of Respondents

In order to assess the persuasive effects of texts on respondents' climate change beliefs, an experimental survey was developed and administered through Amazon's Mechanical Turk (MTurk). MTurk is a crowdsourcing website where individuals can post and complete human intelligence tasks for pay. Respondents were solicited from MTurk by creating a national non-probability sample (this means it is not a valid representation of the US population even though it was a national survey). The survey took approximately 10 minutes to complete and individuals who participated in the survey were paid.

The surveys were launched on March 9 and closed on March 23, 2017. In total, 758 respondents read a text, which this report includes. The breakdown of respondents per text is the following: *Wall Street Journal* (n=142), *Washington Times* (n=146), ExxonMobil (n=165), McKibben (n=153), and Scientific Statement (n=152).

In comparison to the US public, our sample has more white, female, higher educated, and older respondents. In addition to examining results from all respondents, this analysis also divides respondents between conservatives and liberals. While there are more conservative respondents, there are no significant differences between the groups in terms of distribution of the texts. However, the two groups are significantly different in terms of more conservative respondents are male, white, have less than a college degree, attend religious services at least monthly, and are more likely to be from the South or Midwest. While age is not significantly different, conservatives are more likely to be 40 or older.

Upon completing the demographic questions, respondents were randomly assigned a text. In all cases, the text included the title it was provided from, the author(s), the date it was published, and the source. After reading the text, respondents answered a series of questions about global warming, which are based on several sources including Global Warming's Six Americas Screening Tools.<sup>2</sup> Items that measure beliefs are based on questions related to the cause of global warming, level of risk, and US greenhouse gas emissions policy. The questions and possible responses are below:

- (1) What do you believe causes global warming? Mostly human caused; Mostly nature caused; Other; or Global warming is not happening
- (2) Are you worried about global warming? Very worried; Somewhat worried; Not very worried; Not at all worried
- (3) Should the US reduce greenhouse gas emissions? Yes, regardless of other countries; Only if other industrialized countries; Only if other industrialized and developing countries; or No.

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<sup>2</sup> To read more about the Global Warming's Six Americas Screening Tools: Maibach, E.W., Leiserowitz A., Roser-Renouf, C., Mertz, C.K., & Akerlof, K. (2011). Global Warming's Six Americas screening tools: Survey instruments; instructions for coding and data treatment; and statistical program scripts. *Yale Project on Climate Change Communication, New Haven, CT.*

**Table 1. Comparing Attributes of Texts**

<b>Title</b>	“A Conservative Answer to Climate Change”	“The Doctored Science of Global Warming”	“Our Position on Climate Change”	“What Exxon Knew About Climate Change”
<b>Author</b>	George P. Schultz & James A. Baker III (Conservative Political Officials)	The Washington Times Staff	ExxonMobil Corporate Team	Bill McKibben
<b>Source</b>	<i>Wall Street Journal</i>	<i>The Washington Times</i>	<i>ExxonMobil</i>	<i>The New Yorker</i>
<b>Date</b>	February 7, 2017	March 3, 2016	Retrieved March 3, 2017; published unknown	September 18, 2015
<b>Word Count</b>	860	536	152	899
<b>Themes</b>	economic growth, government regulations, American competitiveness, protecting the working-class	scientific fraud, government corruption, collusion, climate science skepticism	Energy, greenhouse gas emission reduction, corporate policy	Energy, corporate deception, scientific consensus, corporate policy
<b>Target Audience</b>	Republicans	climate change skeptics	general public	environmentalists
<b>Actors</b>	U.S. energy and technology industry, American working-class, Republicans	NOAA, Obama Administration, environmental agencies	ExxonMobil, climate scientists	ExxonMobil, US government (EPA, NASA), InsideClimate
<b>Strategy</b>	To illustrate how a carbon tax can reduce government regulations, and increase American competitiveness while distributing proceeds to the working-class.	To convince the public that the science concerning climate change is fraudulent and collusion is occurring between scientists and government.	To explain that ExxonMobil recognizes the risk of climate change and seeks to reduce emissions, while providing energy.	To demonstrate that ExxonMobil has attempted to curtail climate change policy and awareness to benefit their corporation.

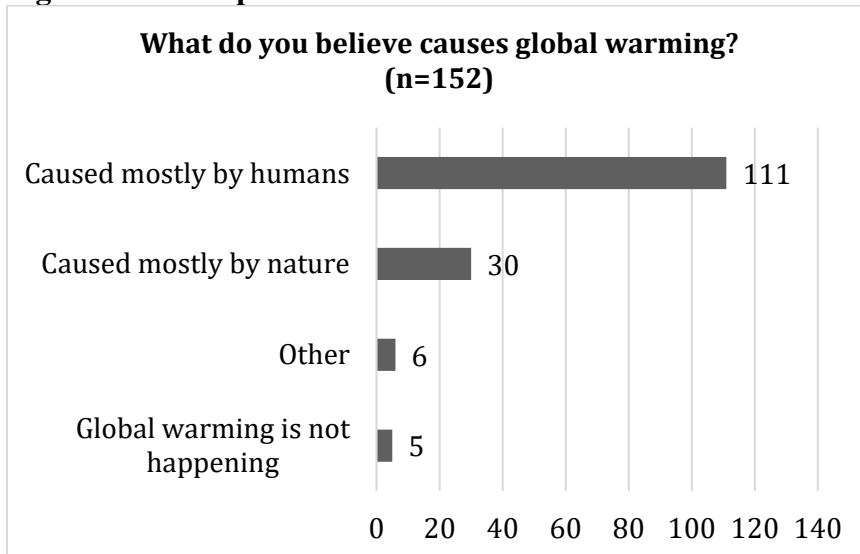
## Results

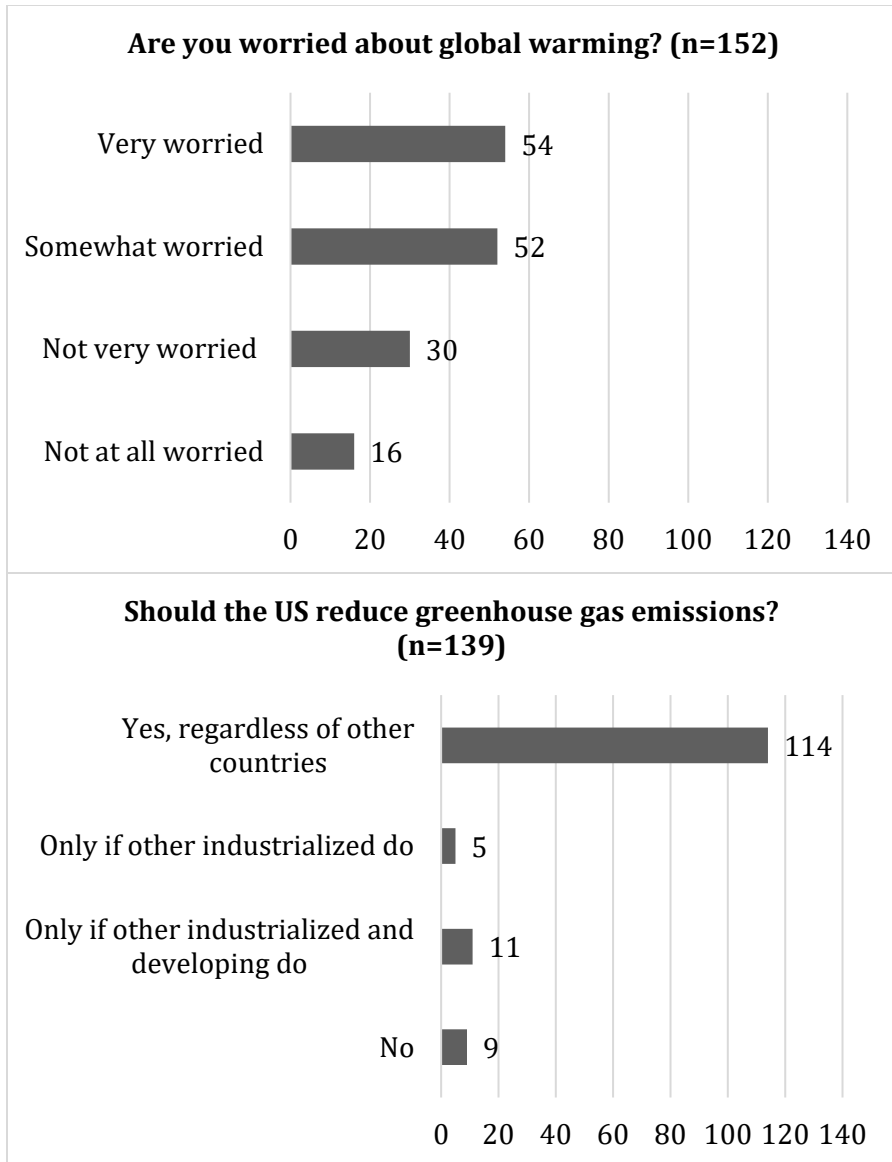
The results of the paper are organized as follows: the frequency that respondents indicate the causes of global warming, the level of concern or perceived risk, and their national policy position. The results are organized by the text randomly assigned to read and are in the following order: Scientific Statement, *Wall Street Journal*, *Washington Times*, ExxonMobil, and McKibben. These results are reported based on all respondents, only conservatives, and only liberals.

### Scientific Statement

The results below present data from respondents that were randomly selected to read a scientific statement on climate change. The data are presented as the frequency for each category of response for the following questions: (1) What do you believe causes global warming? (2) Are you worried about global warming? (3) Should the US reduce greenhouse gas emissions?

**Figure 1. All Respondents**

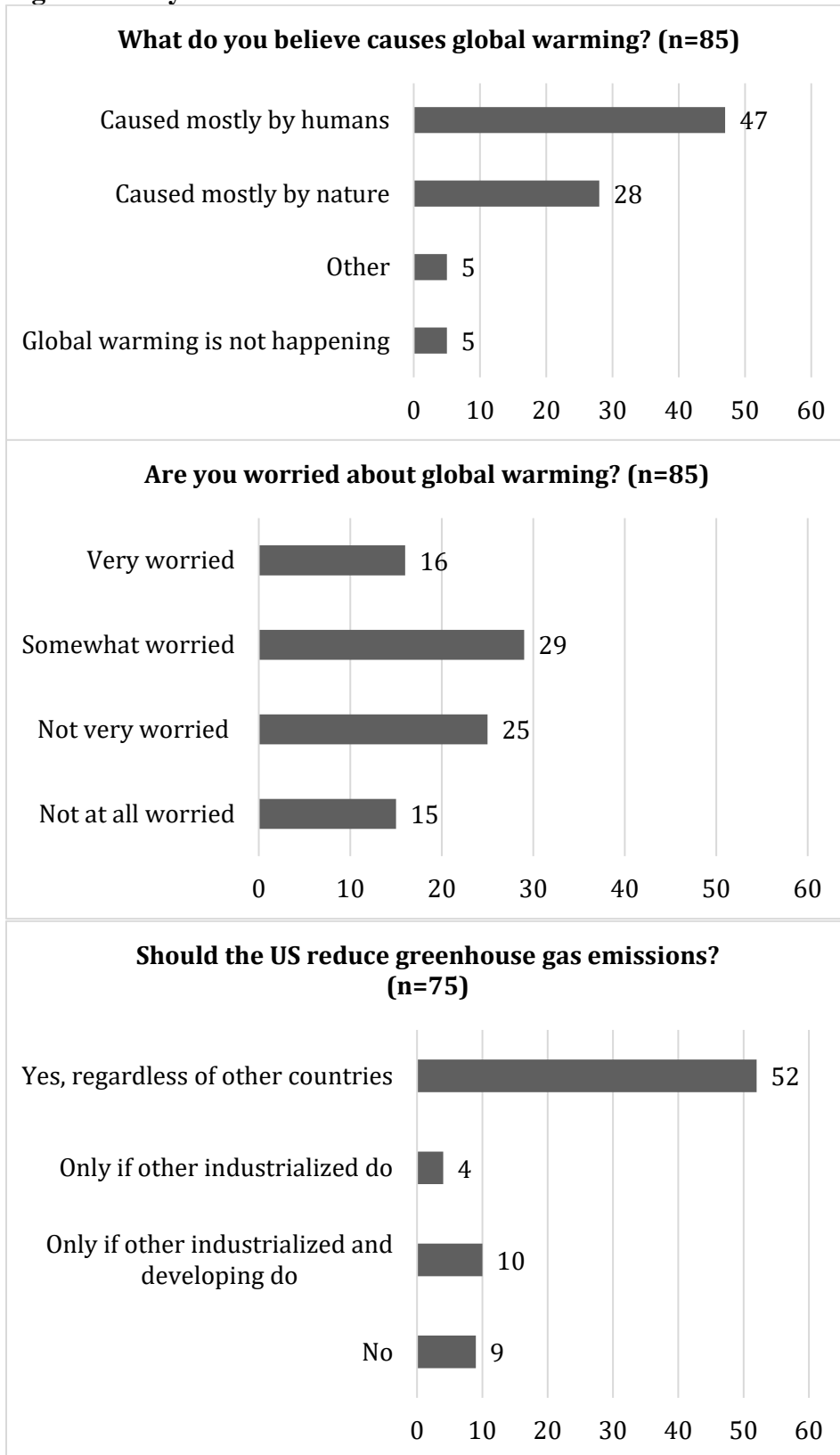




**Among all respondents** that read the scientific statement there are a couple of clear trends. In terms of the causes of global warming, 73% of respondents (111/152) indicated that they believed it was caused mostly by humans. This indicates that the vast majority of respondents agreed with climate scientists on the causes of climate change. The responses for level of concern or perceived risk due to global warming are high. Overall, 70% of respondents (106/152) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results again reveal that a vast majority of respondents share the same position. Overall, 82% of respondents (114/139) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that over 7/10 respondents that read a scientific statement believe humans cause climate change, are worried, and support the reduction of greenhouse gas emissions by the US.

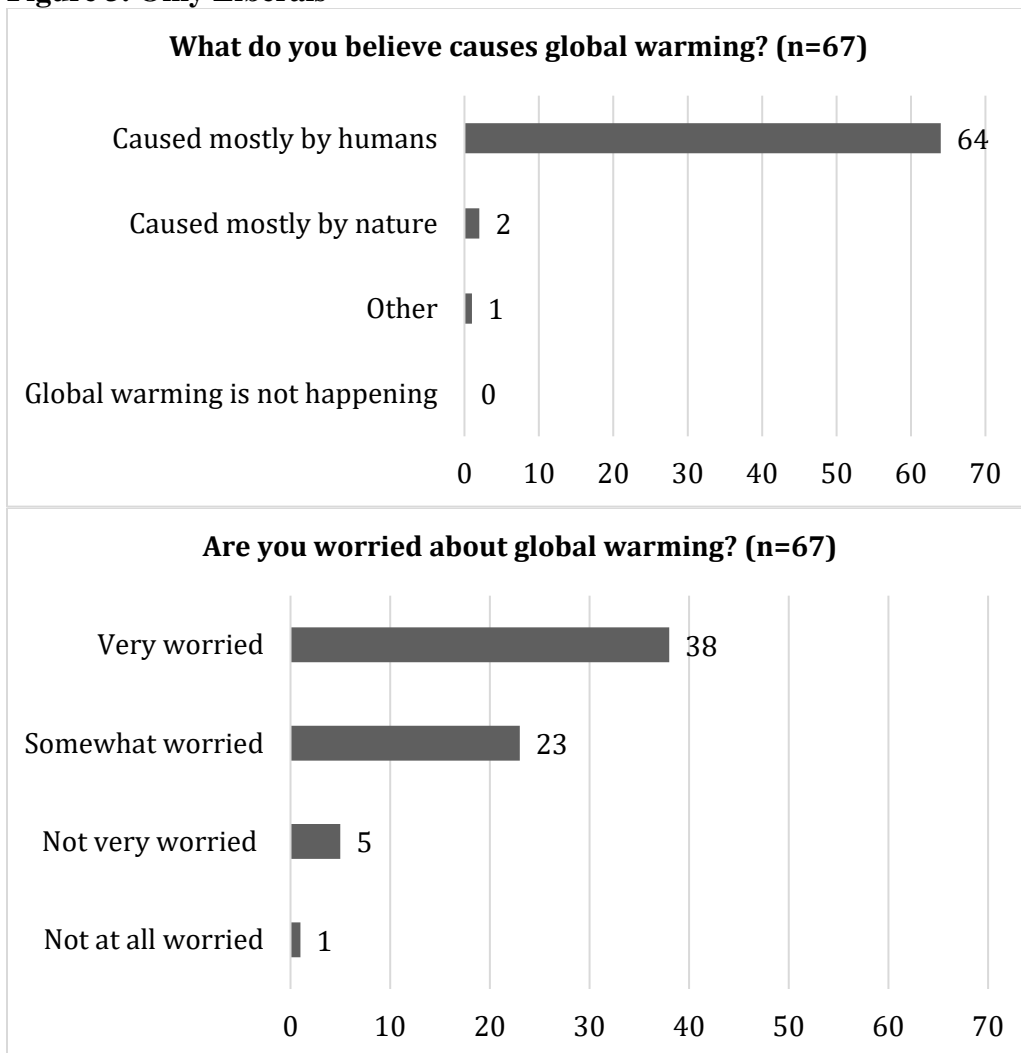


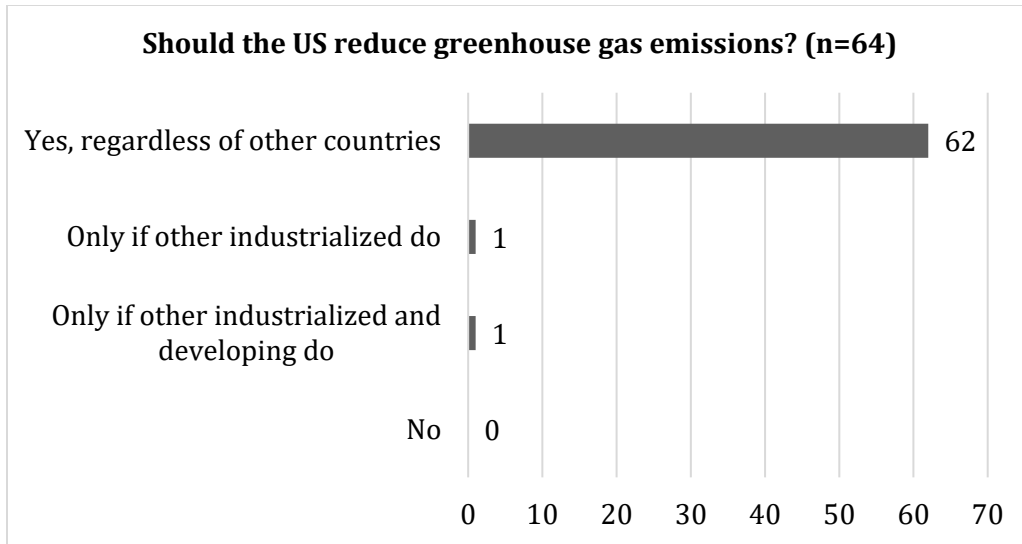
**Figure 2. Only Conservatives**



**Among only conservative** respondents, that read the scientific statement there are a couple of clear trends. In terms of the causes of global warming, 55% of respondents (47/85) indicated that they believed it was caused mostly by humans compared to 33% (28/85) that it is caused mostly by nature. This indicates that a slight majority of respondents agreed with climate scientists on the causes of climate change. The responses for level of concern or perceived risk due to global warming are also mixed. Overall, 53% of respondents (45/85) indicated that they were at least “somewhat worried”. In contrast, in terms of policy position the results reveal that a vast majority of conservative respondents share the same position. Overall, 69% of respondents (52/75) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that about 5/10 conservative respondents that read a scientific statement believe humans cause climate change, are worried, and there is even greater support for the reduction of greenhouse gas emissions by the US.

**Figure 3. Only Liberals**



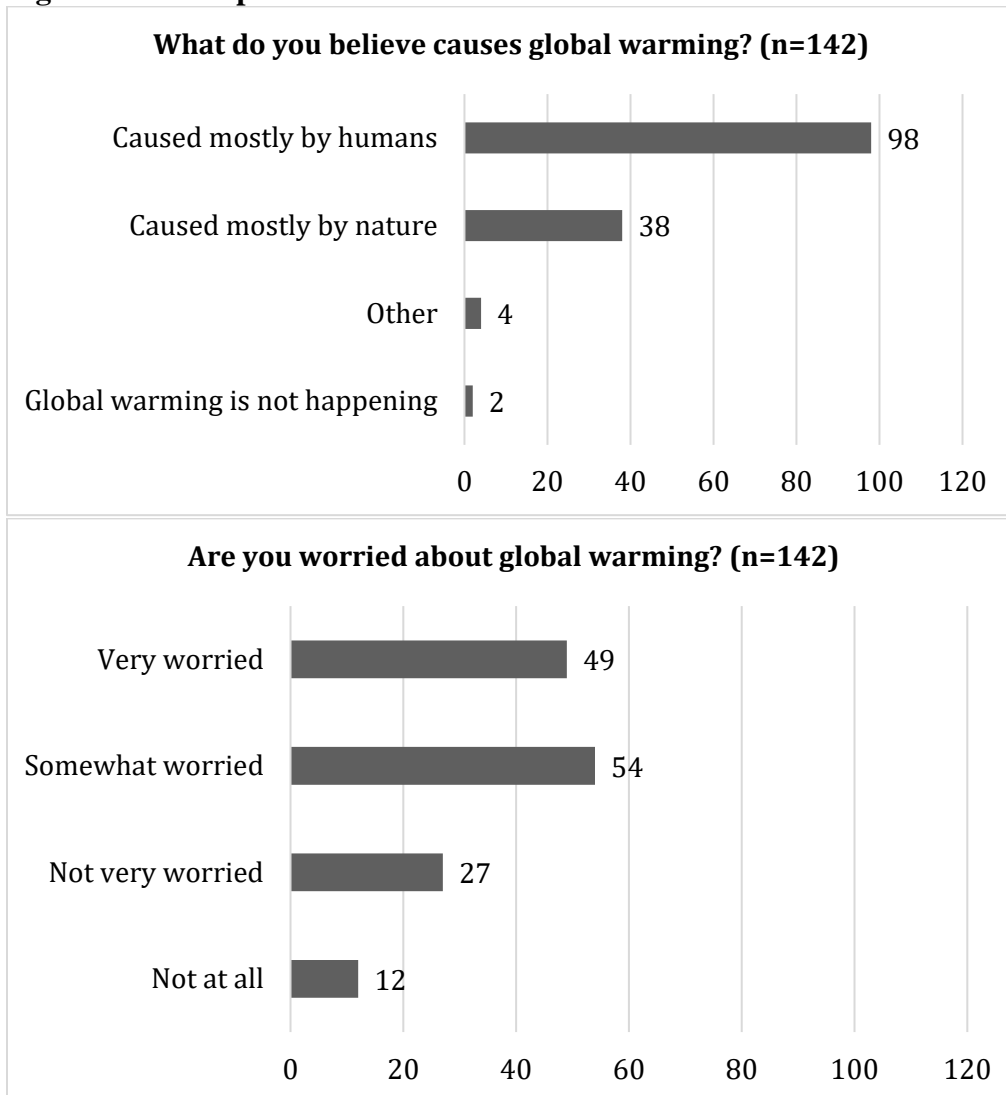


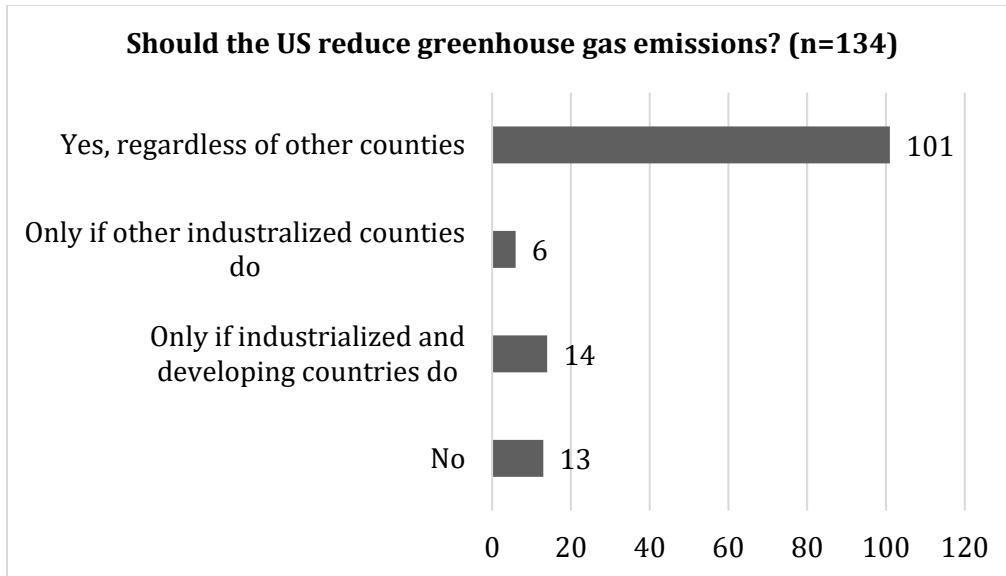
**Among only liberal** respondents, that read the scientific statement there are a couple of clear trends. In terms of the causes of global warming, 96% of respondents (64/67) indicated that they believed it was caused mostly by humans compared to 55% among only conservative respondents. This indicates that there is a large difference between liberals and conservatives in terms of the causes of global warming after reading a scientific statement. The responses for level of concern or perceived risk due to global warming are clear. Overall, 91% of respondents (61/67) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results reveal that a vast majority of liberal respondents share the same position. Overall, 97% of respondents (62/64) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that about 9/10 liberal respondents that read a scientific statement believe humans cause climate change, are worried, and support the reduction of greenhouse gas emissions by the US.

*Wall Street Journal*

The results below present data from respondents that were randomly selected to read the Wall Street Journal text. The data are presented as the frequency for each category of response for the following questions: (1) What do you believe causes global warming? (2) Are you worried about global warming? (3) Should the US reduce greenhouse gas emissions?

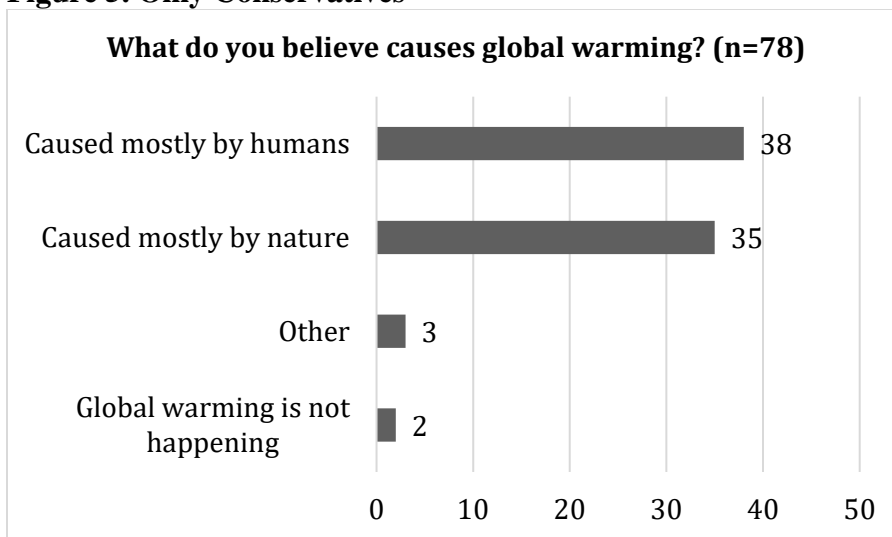
**Figure 4. All Respondents**

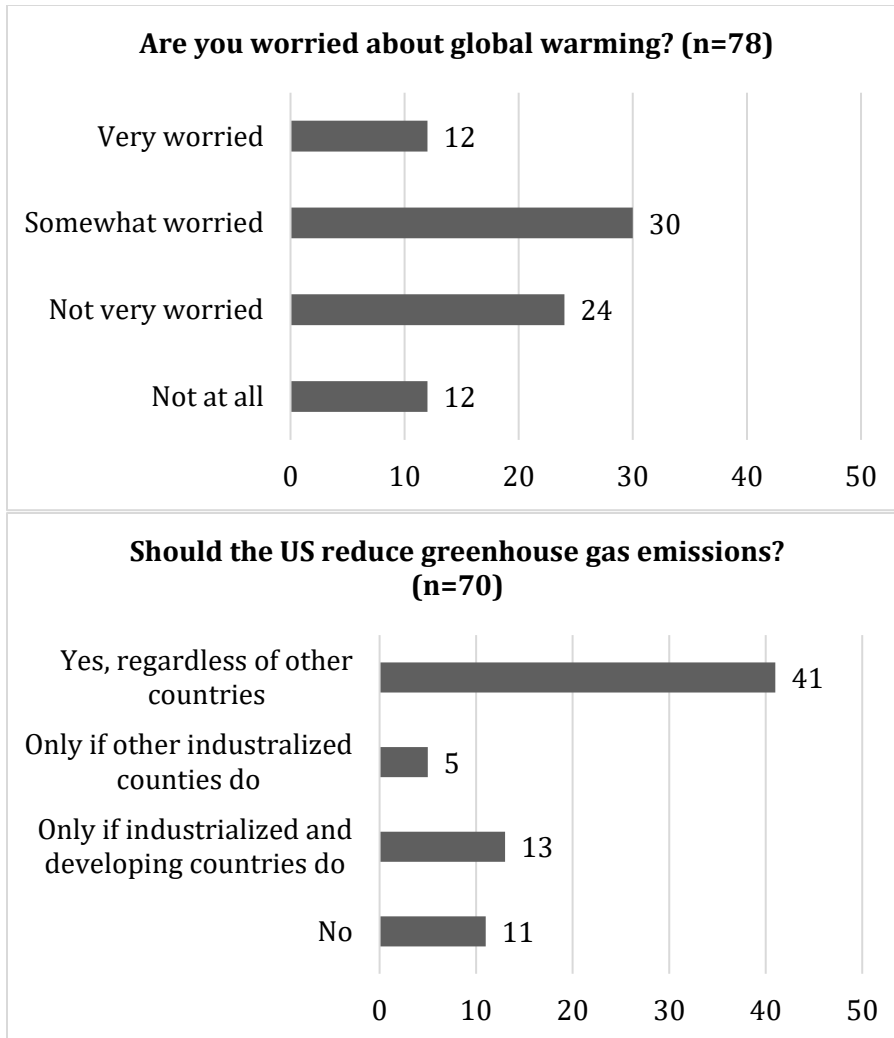




**Among all respondents** that read the *Wall Street Journal* there are a couple of clear trends. In terms of the causes of global warming, 69% of respondents (98/142) indicated that they believed it was caused mostly by humans. This indicates that the vast majority of respondents agreed with climate scientists on the causes of climate change. The responses for level of concern or perceived risk due to global warming are high. Overall, 73% of respondents (103/142) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results again reveal that a vast majority of respondents share the same position. Overall, 75% of respondents (101/134) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that among all respondents about 7/10 that read the *Wall Street Journal* text believe humans cause climate change, are worried, and support the reduction of greenhouse gas emissions by the US. There are no significant differences compared to those that read the scientific statement.

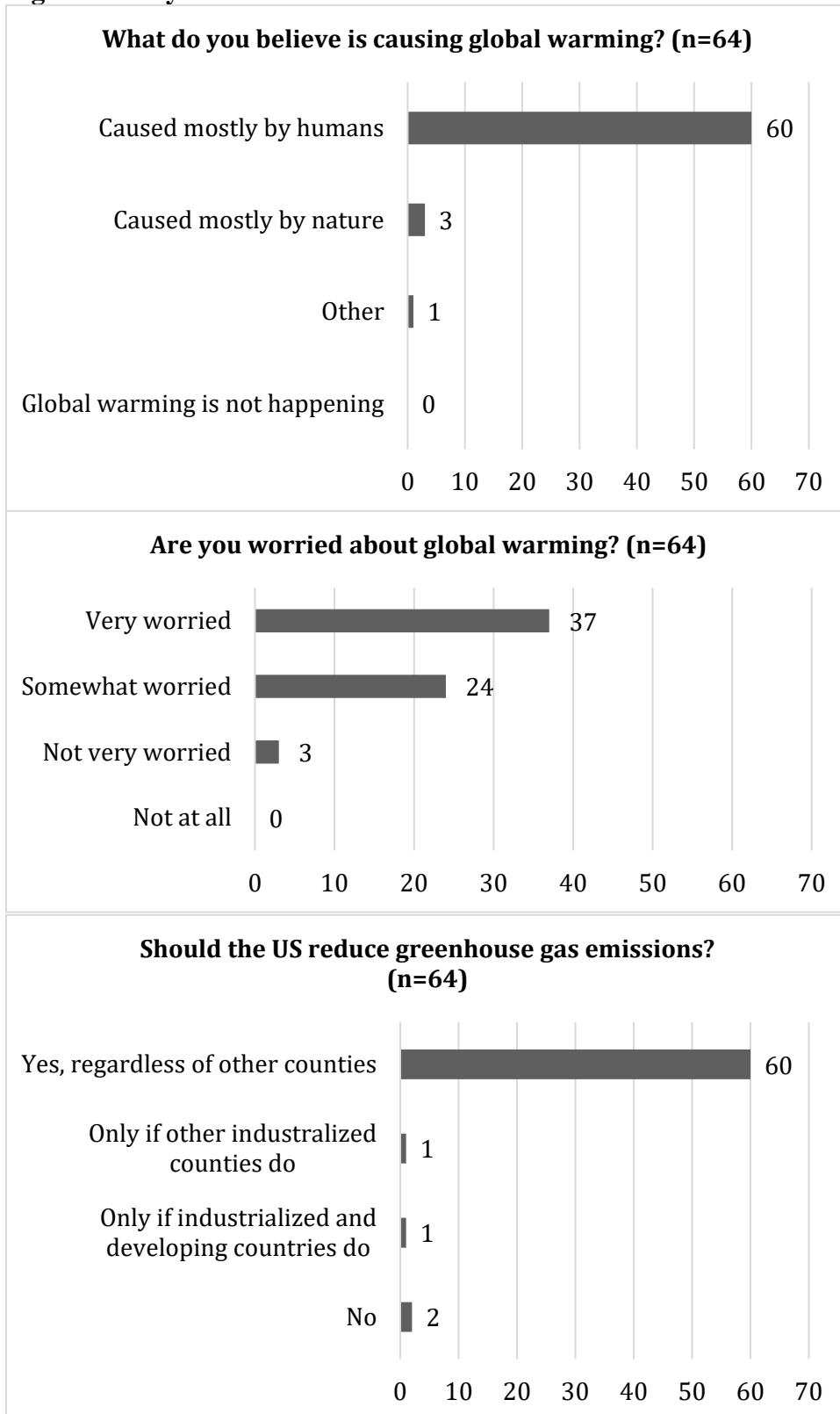
**Figure 5. Only Conservatives**





**Among only conservative** respondents who are the target audience that read the *Wall Street Journal* text there is a great amount of variation in responses. In terms of the causes of global warming, 49% of respondents (38/78) indicated that they believed it was caused mostly by humans compared to 45% (35/78) that it is caused mostly by nature. The responses for level of concern or perceived risk due to global warming are also mixed. Overall, 54% of respondents (42/78) indicated that they were at least “somewhat worried”. Consistent with these results, 59% of respondents (41/70) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that about 5/10 conservative respondents that read a scientific statement believe humans cause climate change, are worried, and there is slightly greater support for the reduction of greenhouse gas emissions by the US. Overall, these results are not different than a scientific statement and in some cases, such as the policy question are less persuasive. This is not a good indication as conservatives are the target of this text.

**Figure 6. Only Liberals**



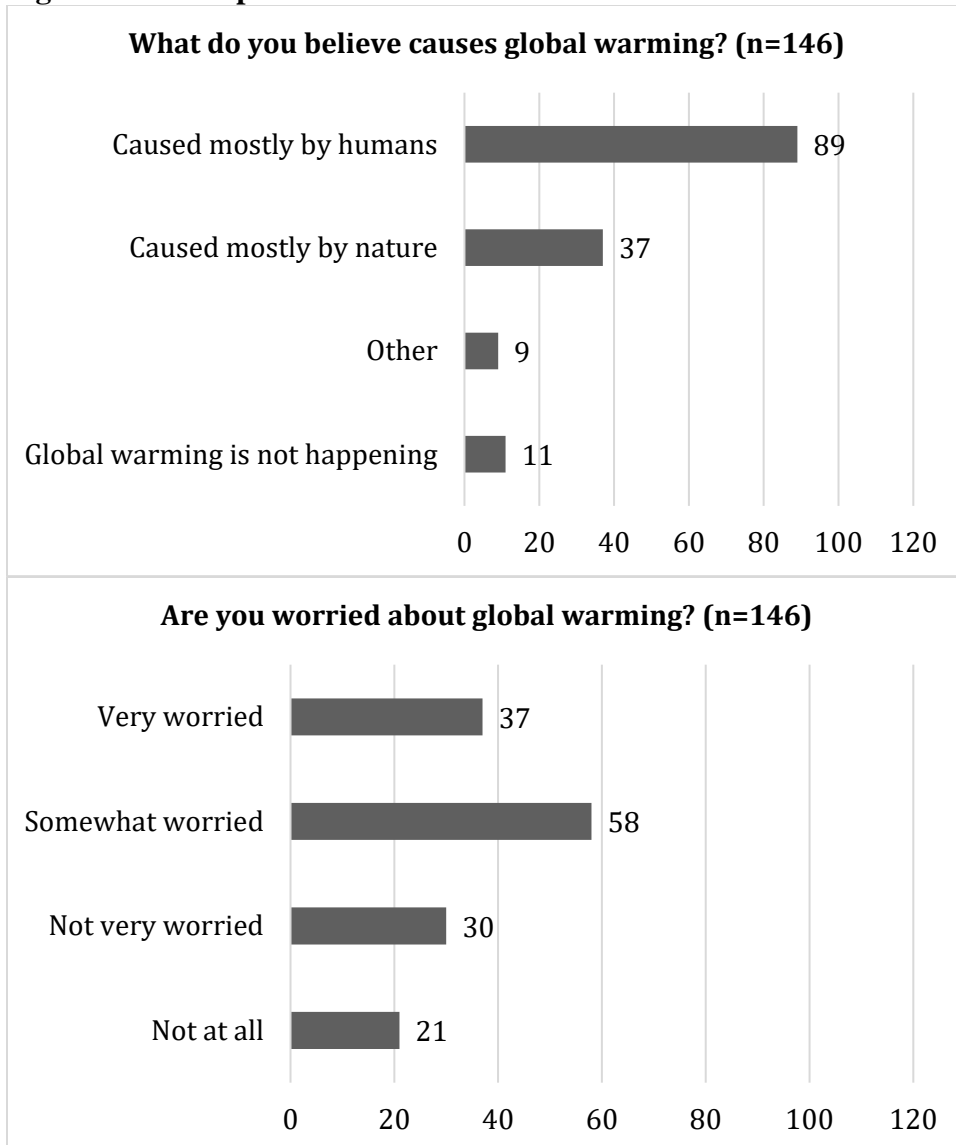
**Among only liberal** respondents, that read the *Wall Street Journal* text there is little variation. In terms of the causes of global warming, 94% of respondents (60/64) indicated that they believed it was caused mostly by humans compared to 49% among only conservative respondents that read the same text. This indicates that there is a large difference between liberals and conservatives in terms of the causes of global warming after reading the *Wall Street Journal* text. The responses for level of concern or perceived risk due to global warming are clear. Overall, 95% of respondents (61/64) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results reveal that a vast majority of liberal respondents share the same position. Overall, 94% of respondents (60/64) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that 9/10 liberal respondents that read the *Wall Street Journal* text believe humans cause climate change, are worried, and support the reduction of greenhouse gas emissions by the US. There are no significant differences with respondents that read the scientific statement.

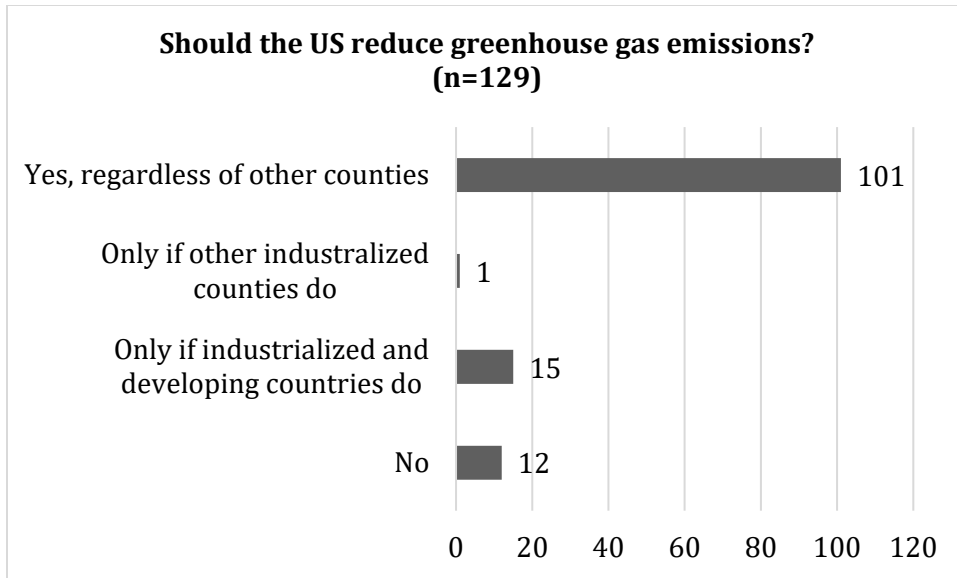


*Washington Times*

The results below present data from respondents that were randomly selected to read the *Washington Times* text. This text argues that there is a conspiracy between climate scientists and the Obama administration to make it appear that humans are causing climate change. The data are presented as the frequency for each category of response for the following questions: (1) What do you believe causes global warming? (2) Are you worried about global warming? (3) Should the US reduce greenhouse gas emissions?

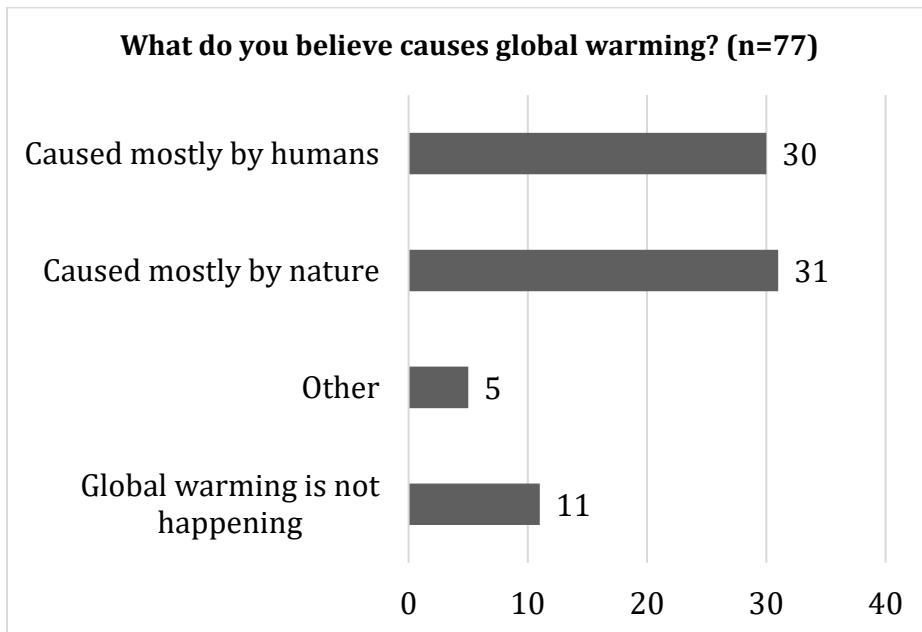
**Figure 7. All Respondents**

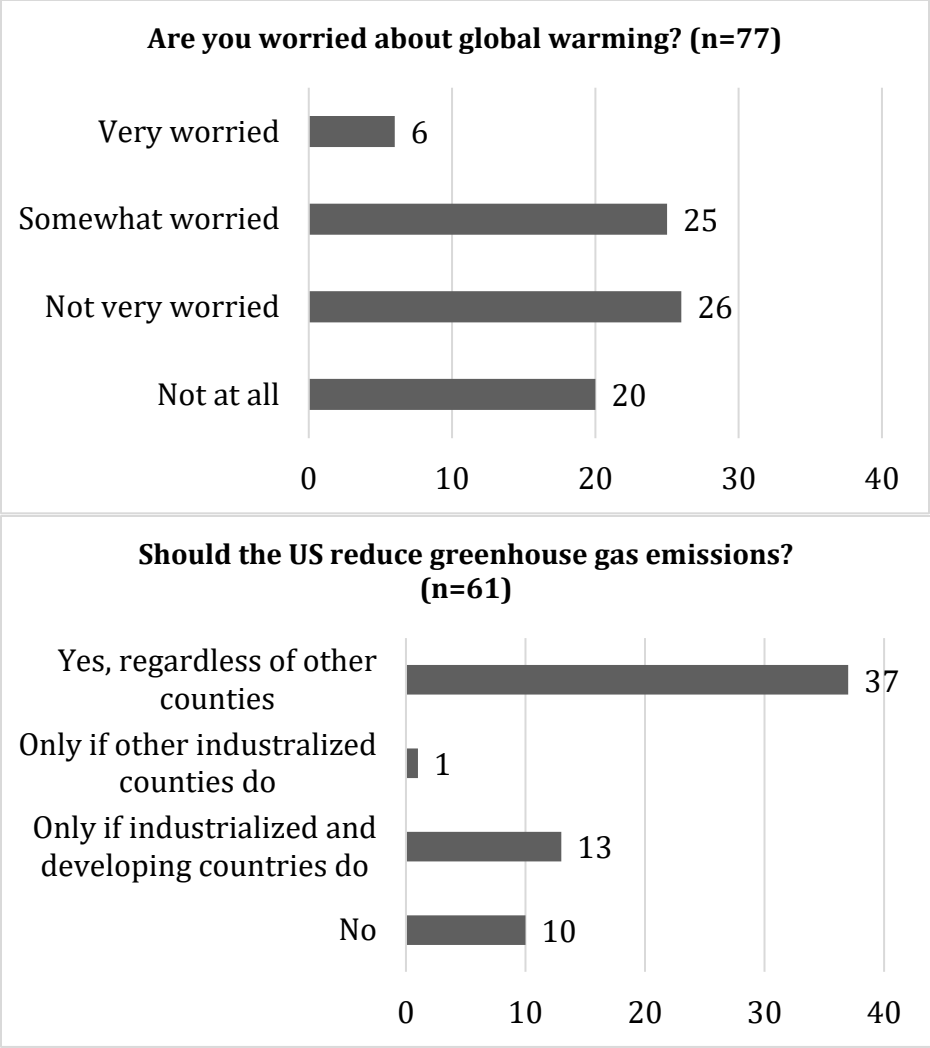




Among all respondents that read the *Washington Times* text, the causes of global warming, 61% of respondents (89/146) believe climate change is mostly human caused is significantly lower in comparison to 73% that read the scientific statement. Overall, 65% of respondents (95/146) indicated that they were at least “somewhat worried” which is about the same as the 70% among those that read the scientific statement. Finally, in terms of policy position, 78% of all respondents (101/129) indicated that the US should reduce greenhouse gas emissions regardless of other countries. This is about the same as the 82% that read the scientific statement. Therefore, the conspiracy text has a negative effect on beliefs about causes but not on risk perception or policy position.

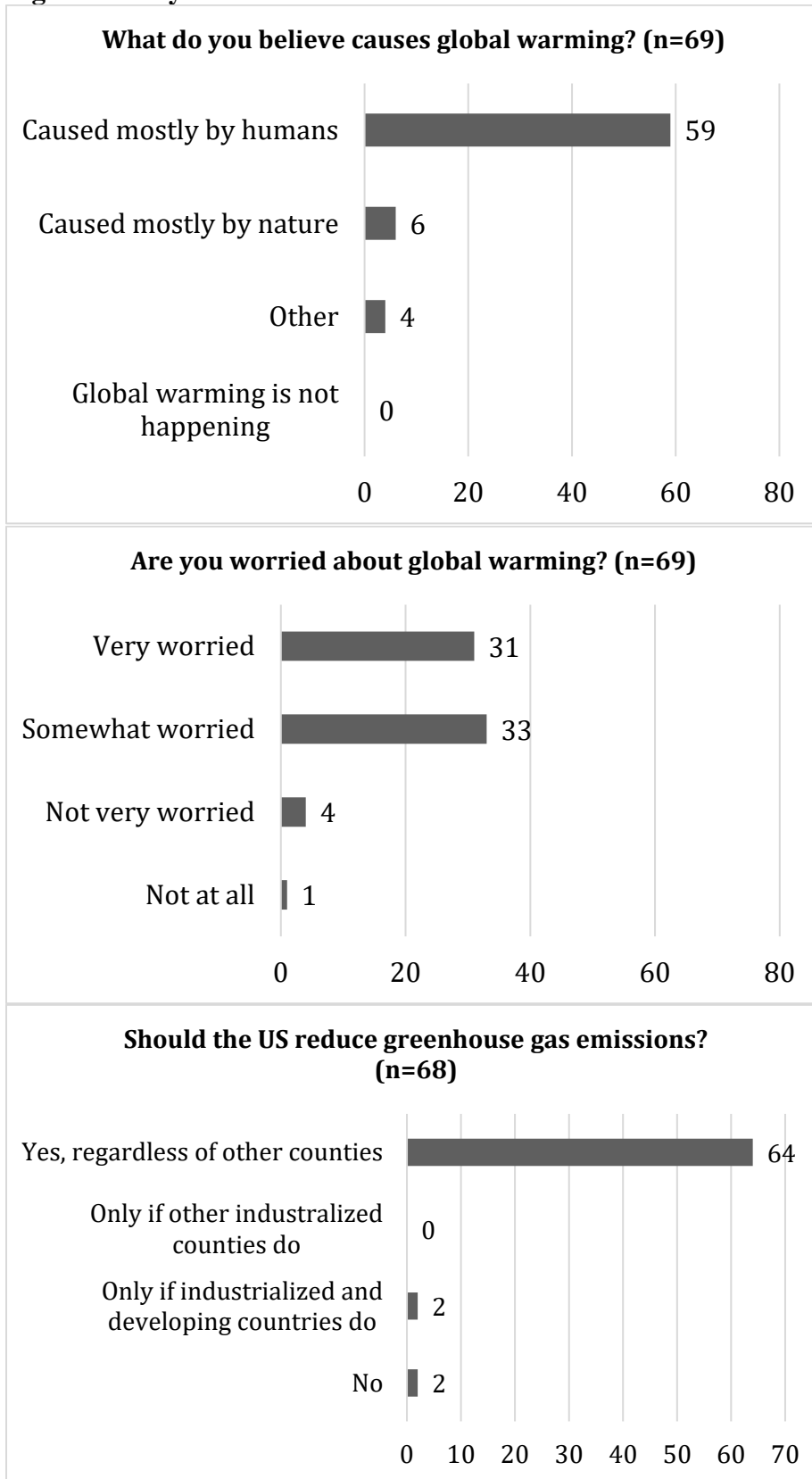
**Figure 8. Only Conservatives**





**Among only conservative** respondents that read the *Washington Times* text there is a great amount of variation. In terms of the causes of global warming, 39% of conservative respondents (30/77) indicated that they believed it was caused mostly by humans compared to 55% of conservatives that read the scientific statement. The responses for level of concern or perceived risk due to global warming are clear. Overall, 40% of conservative respondents (31/77) indicated that they were at least “somewhat worried”. This is significantly lower than the 53% of conservatives that read the scientific statement. Finally, in terms of policy position, the results reveal a majority (61%) of conservative respondents’ support US reduction of greenhouse gases. However, this is not significantly different than the 69% of conservatives that read the scientific statement.

**Figure 9. Only Liberals**

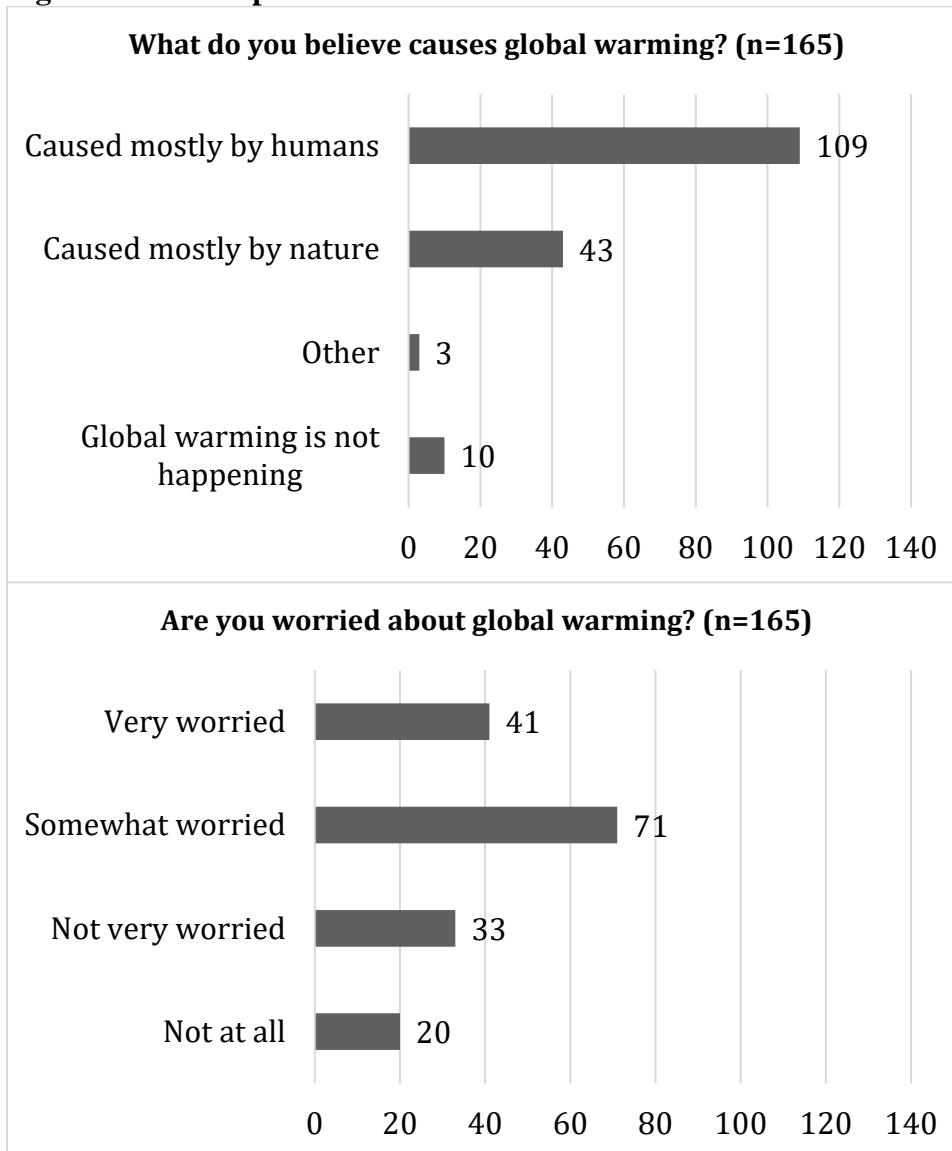


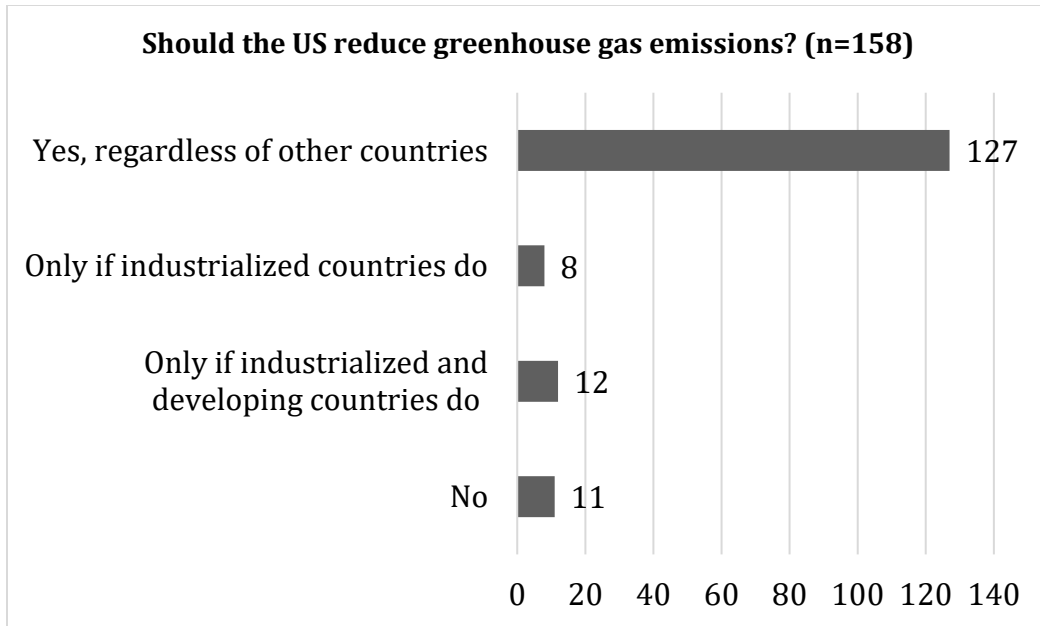
**Among only liberal** respondents that read the *Washington Times* text there is little variation in responses. In terms of the causes of global warming, 86% of liberal respondents (59/69) indicated that they believed it was caused mostly by humans. This is a significant difference from the 96% of liberals that believe mostly human causes of global warming that read the scientific statement. The responses for level of concern or perceived risk due to global warming are clear. Overall, 93% of liberals (64/69) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results reveal that a vast majority of liberal respondents share the same position. Overall, 94% of respondents (64/68) indicated that the US should reduce greenhouse gas emissions regardless of other countries. While in terms of risk perception and policy there are no significant differences from the liberals that read the scientific statement, it is important to note that in terms of believing the causes liberals that read the conspiracy text respond about 10% lower concerning the human causes of global warming.

## ExxonMobil

The results below present data from respondents that were randomly selected to read the ExxonMobil text. The data are presented as the frequency for each category of response for the following questions: (1) What do you believe causes global warming? (2) Are you worried about global warming? (3) Should the US reduce greenhouse gas emissions?

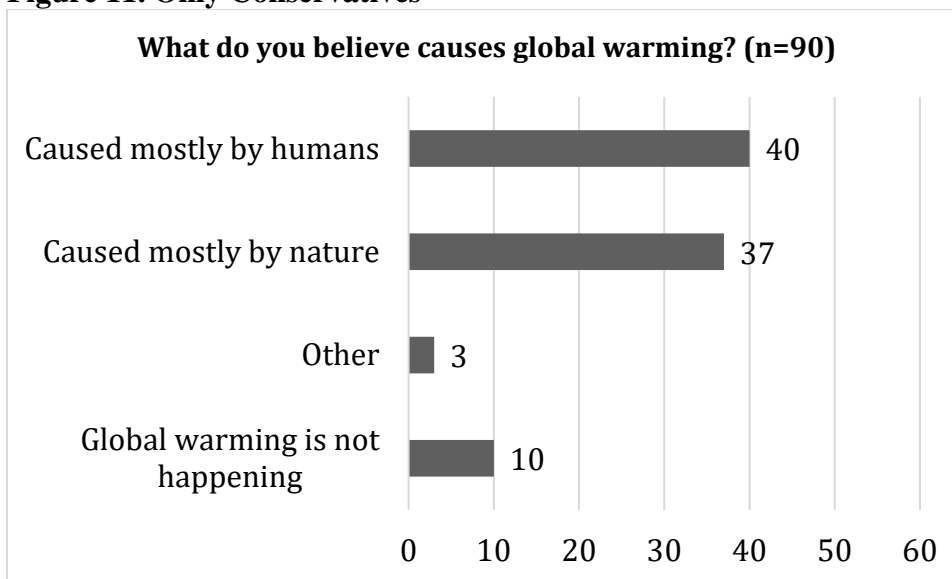
**Figure 10. All Respondents**

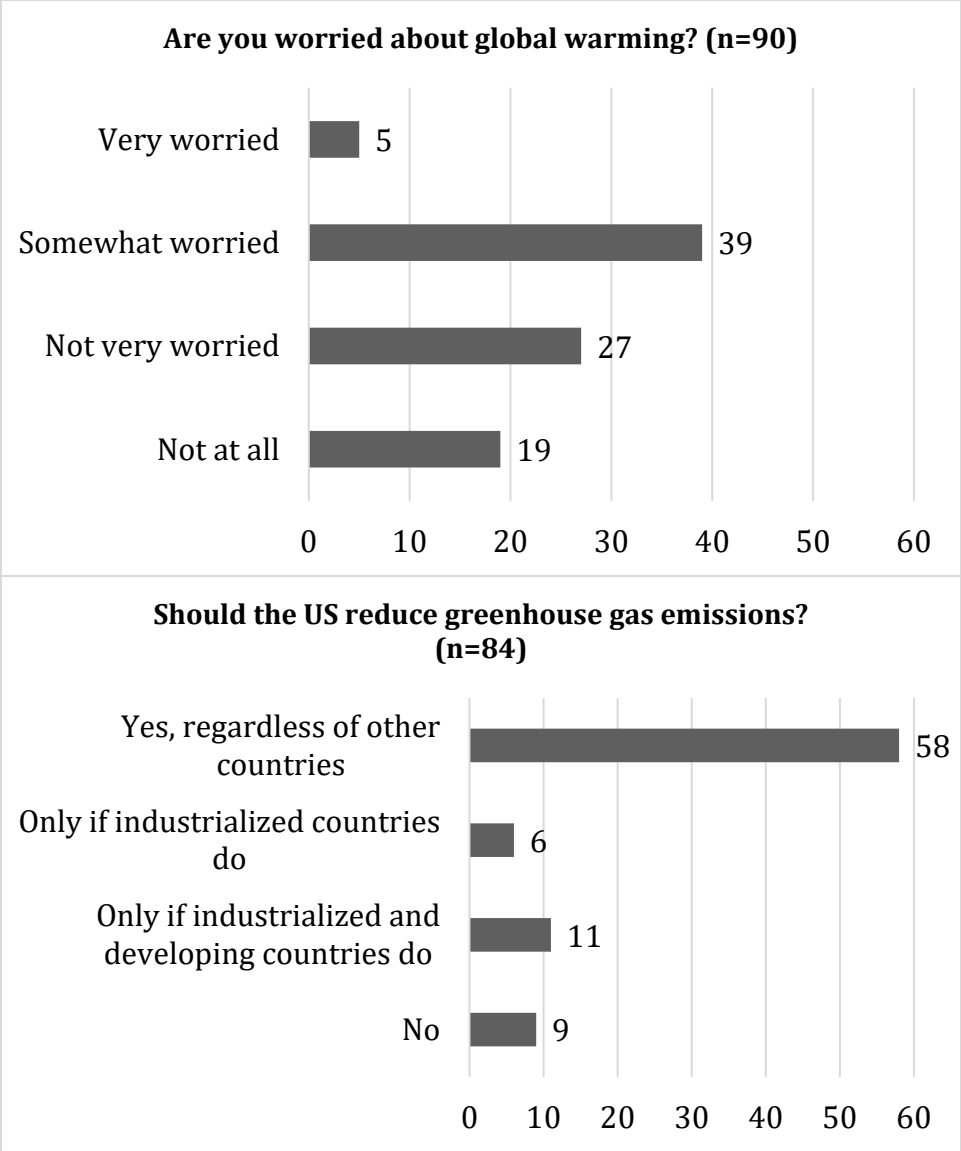




**Among all respondents** that read the ExxonMobil text, there is some variation. Global warming being mostly caused by humans was identified by 66% (109/165) of all respondents. In terms of risk perception, 68% (112/165) are at least “somewhat worried” about global warming which is similar to the 70% that read the scientific statement. Finally, the results reveal that the vast majority of all respondents share the same policy position. Roughly 80% of respondents (127/158) believe that the U.S. should reduce greenhouse gas emissions regardless of other countries. None of these frequency of responses is significantly different than those that read a scientific statement.

**Figure 11. Only Conservatives**

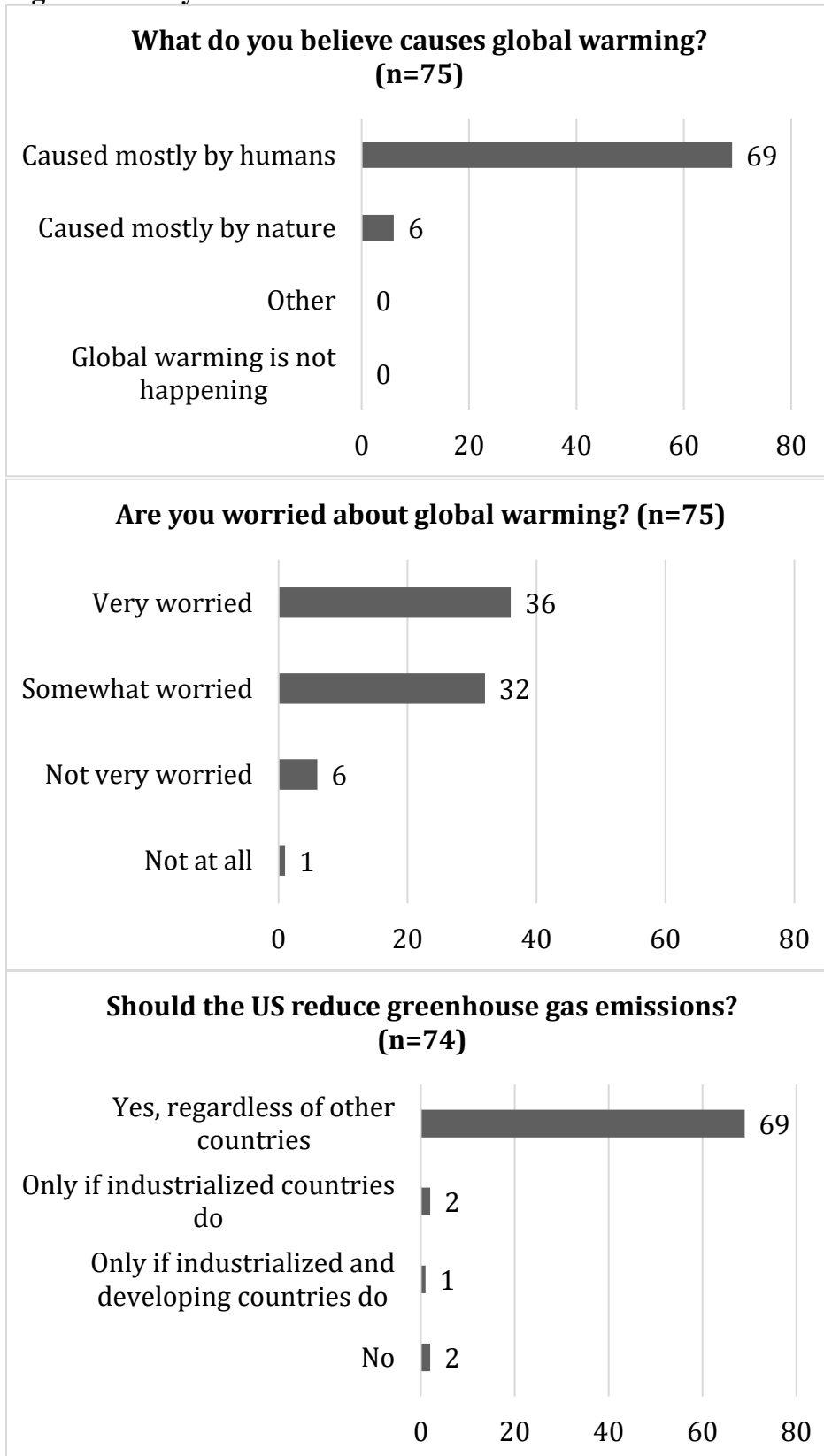




**Among only conservative respondents** that read the ExxonMobil text, the results vary. A minority of respondents, 44% (40/90), among conservative believe that global warming is mostly caused by humans. While 55% of conservative respondents that read the scientific believe mostly human causes the difference among those that read the ExxonMobil text is not significant. About half (49%, 44/90) of respondents indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results reveal that vast majority of conservative respondents share the same position. Overall, 69%% of respondents (58/84) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that while about half of conservatives that read the ExxonMobil text believe in human causes and somewhat worried, the percentage that support reduction of greenhouse gas emissions is much higher.



**Figure 12. Only Liberals**

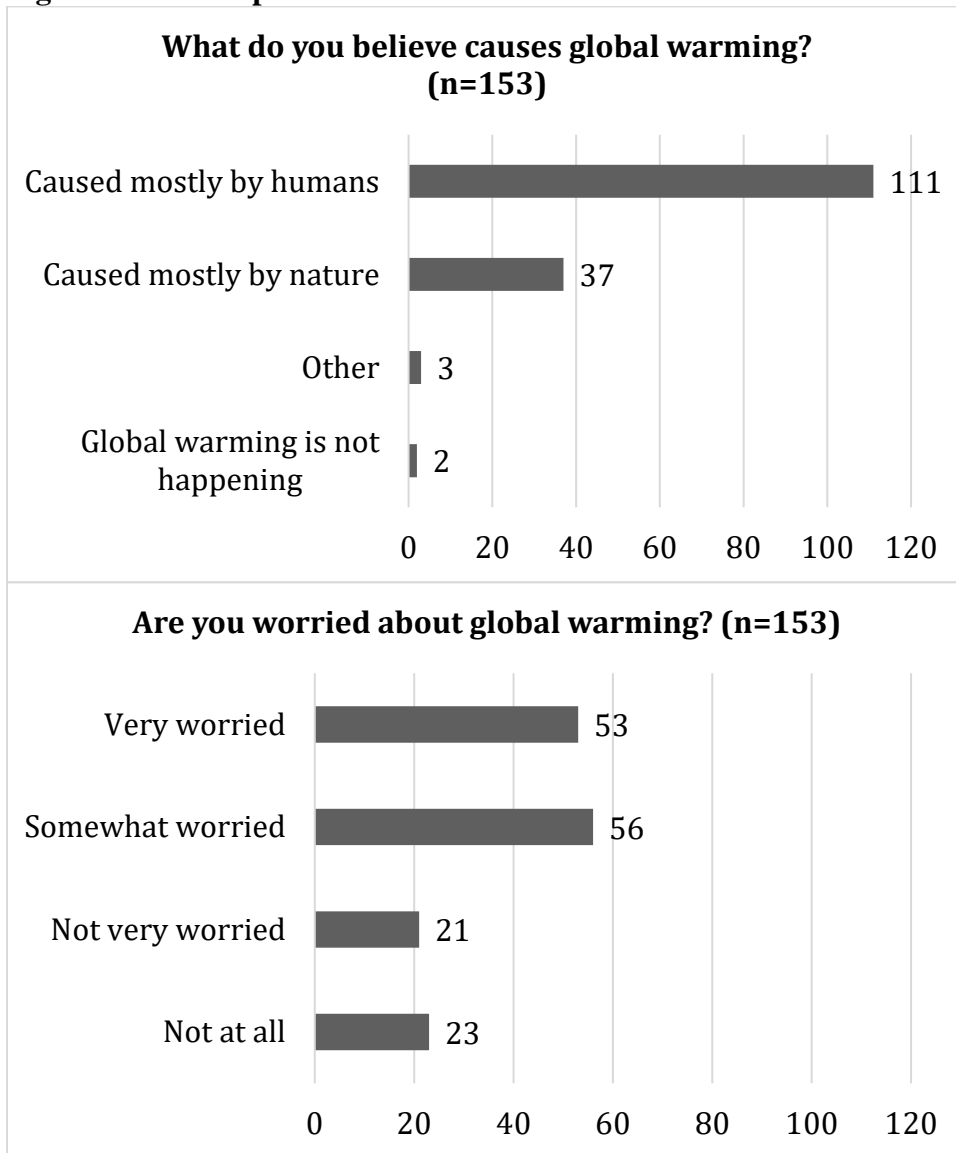


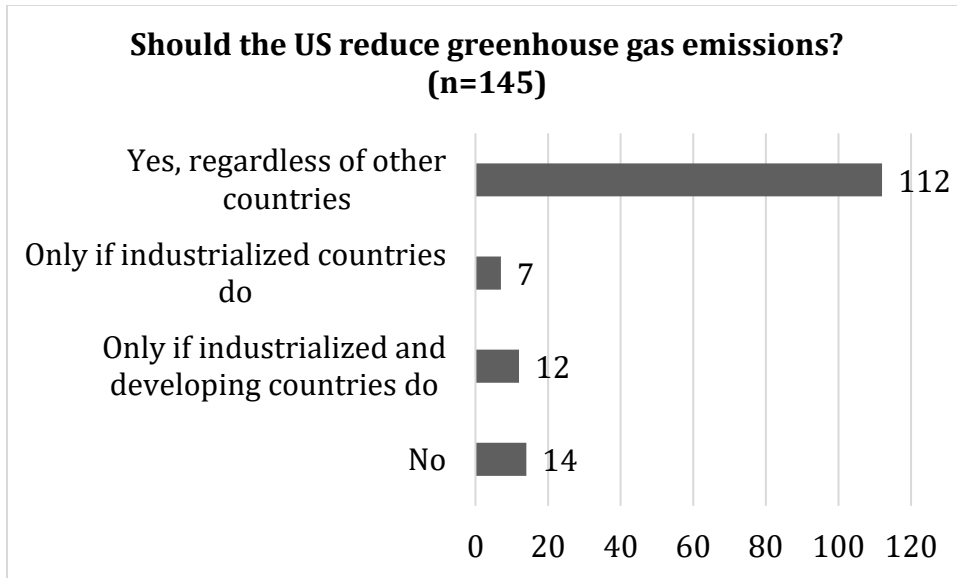
**Among only liberal respondents** that read the ExxonMobil text, the results do not vary. Of liberal respondents, 92% (69/75) of liberal respondents believed that global warming was primarily due to human causes. Overall, 91% of liberal respondents (68/75) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results reveal that a vast majority of liberal respondents share the same position. Overall, 93% of respondents (69/74) indicated that the US should reduce greenhouse gas emissions regardless of other countries. Combined, these results show that about 9/10 liberal respondents that read the Exxon Mobile text believe humans cause climate change, are worried, and support the reduction of greenhouse gas emissions by the US. This is consistent with the liberals that read the other texts as well as the scientific statement.

## McKibben

The results below present data from respondents that were randomly selected to read the McKibben text. The data are presented as the frequency for each category of response for the following questions: (1) What do you believe causes global warming? (2) Are you worried about global warming? (3) Should the US reduce greenhouse gas emissions?

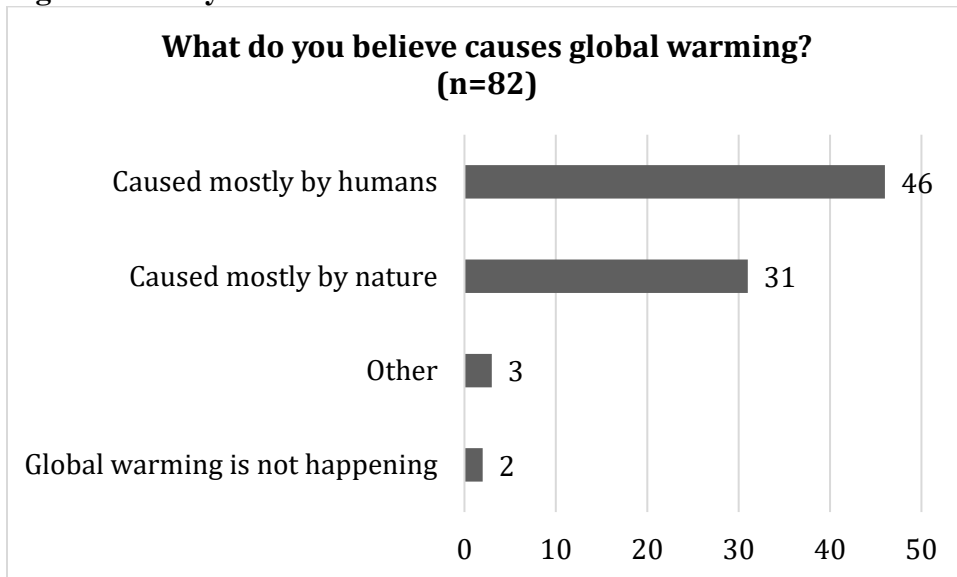
**Figure 13. All Respondents**

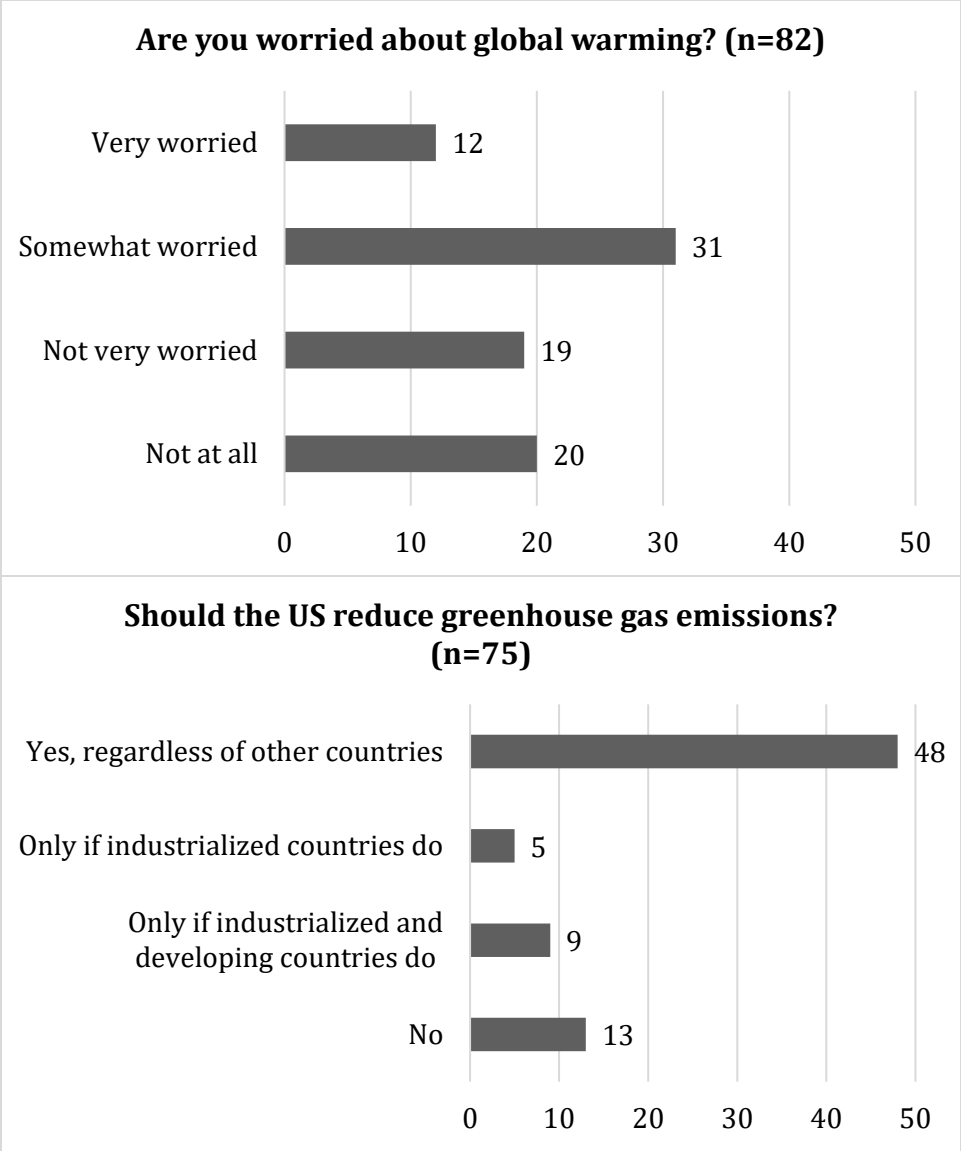




Among all respondents that read the McKibben text, there are a few trends. Among all respondents, 73% (111/153) indicated that they believed global warming was caused mostly by humans. The level of concern being at least “somewhat worried” is 71% (109/153) among all respondents. Finally, the majority of respondents have the same policy position at 77% (112/145) that the US should reduce greenhouse gas emissions.

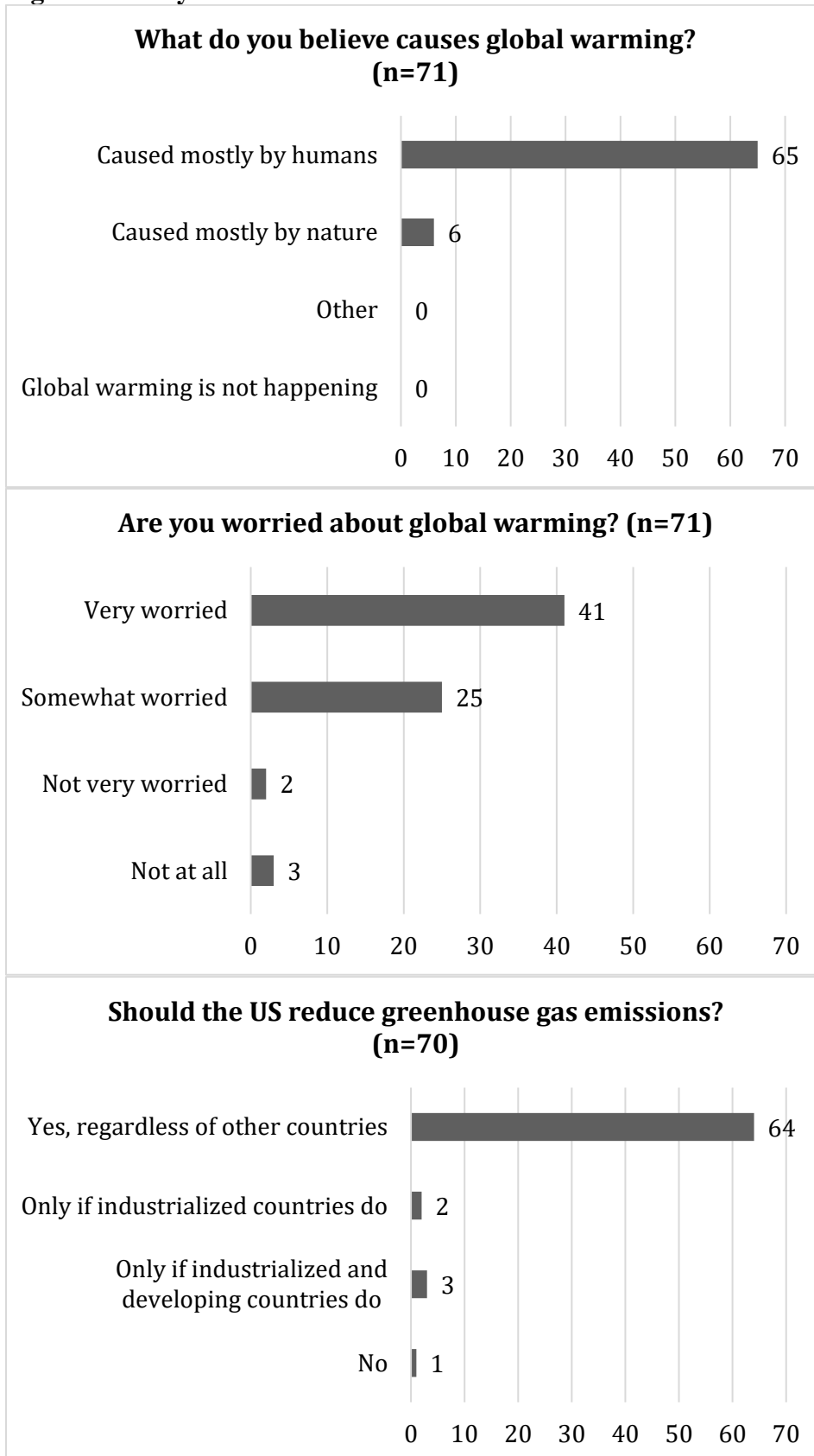
**Figure 14. Only Conservatives**





**Among only conservative respondents** that read the McKibben text, the frequency of responses are lower. Among conservative respondents, 50% (46/82) believed that global warming was primarily human causes. The responses for level of concern or perceived risk due to global warming are clear. Overall, 52% of respondents (43/82) indicated that they were at least “somewhat worried”. Finally, in terms of policy position the results reveal that a majority of respondents, 64% (48/75), indicated that the US should reduce greenhouse gas emissions regardless of other countries. There are no significant differences among conservatives that read the McKibben text compared to the scientific statement.

**Figure 15. Only Liberals**



**Among only liberal** respondents that read the McKibben text there is little variation. Of respondents, 90% (65/71) of liberal respondents believed that global warming was primarily human causes. Liberal respondents indicated that they were at least “somewhat worried” by 93% (66/71) of respondents. In terms of policy position among liberal respondents almost all agree 91% (64/70) that the US should reduce greenhouse gas emissions. Overall, at least 90% of liberal respondents indicated that they support various beliefs about anthropogenic climate change, are worried, and support reduction of greenhouse gases after reading the McKibben text. However, this level is not significantly different than those that read the scientific statement. An important point is that arguably this text target audience are liberals based on the source by *The New Yorker*, the author Bill McKibben an environmentalist, and the theme of attacking Exxon. What this indicates is that the level of persuasion even among the target audience does not differ from reading other texts even a list of scientific statements.

## Discussion

The results reveal a few noteworthy trends among all respondents. First, the current attempts by various conservative and liberal media as well as corporate sources to persuade the public about the causes of climate change are not more effective than a list scientific statements. This study has identified no significant differences among all respondents that read the scientific statement compared to those that read the *Wall Street Journal*, ExxonMobil, or the McKibben texts. In brief, the majority of respondents are worried about climate change, believe that climate change is primarily caused by humans, and support the reduction of greenhouse gas emissions. A second trend is related to the opposing conspiracy text published by the *Washington Times*. Beliefs about human causes of climate change were reportedly lower among all respondents, only conservatives, and only liberals that read this text in comparison to all respondents that read the scientific statement. This finding is especially remarkable because it proves that conspiracy texts are persuasive.

Conservatives are the target audience in this study because many who fall under this category are skeptical about climate change. Nevertheless, the results from this study demonstrated mixed results. In terms of beliefs and worry, about half of conservatives believe in human caused climate change and are somewhat worried. These results are much greater than the 15% of conservatives that believe in human causes of climate change according to the Pew Research Center (October 4, 2016), and the 18% of conservatives that are worried about global warming according to Gallup (March 17, 2017).<sup>3</sup> However, an unexplained large number of conservatives (about 70%) indicated a higher level of support for US policy that reduces greenhouse gas emissions. This observation that conservatives are more likely to support policies mitigating carbon emissions than believe in the human causes of climate change is supported by the Pew Research Center (October 4, 2016). They found while 15% of conservative believe that climate change is mostly due to human activity, 29% support restrictions on power plant emissions, and 27% support international agreements to limit carbon emissions. This research follows this pattern that conservatives are more likely to support carbon mitigating policies than believe human activity is causing climate change.

Among all conservatives that read the scientific statement, *Wall Street Journal*, ExxonMobil, and the McKibben texts, the results did not reveal any significant differences between the texts. In contrast, the *Washington Times* text results demonstrated significant variation. Relative to those that read the scientific statement, a significantly lower number of conservatives are at least somewhat worried about climate change and do not believe in human causes. Yet in terms of policy position, a majority still support US reduction of greenhouse gases.

Among all liberal respondents, the results are generally aligned with the conventional US liberal ideology of conservation and sustainability. The results demonstrate that a text like McKibben's targeting liberals does not influence their beliefs on climate change in comparison to a scientific statement. However, the *Washington Times* text demonstrated an effect among all liberals. In response to the question about beliefs, 10% fewer liberal respondents identified mostly human

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<sup>3</sup> The Pew Research Report by Funk and Kennedy (October 4, 2016) can be found here: <http://www.pewinternet.org/2016/10/04/the-politics-of-climate/> and the Gallup poll (March 17, 2017) can be found here: <http://www.pewinternet.org/2016/10/04/the-politics-of-climate/>.



causes of global warming. This demonstrates that it may be difficult to persuade liberals any more in terms of increasing beliefs about climate change, but they may be susceptible to decreasing their beliefs.

There exists a division in beliefs and perceived risk between conservatives and liberals. Clearly, the vast majority of liberals are concerned about climate change in terms of human causes, risk, and US policy. On the other hand, conservatives show mixed responses related to climate change beliefs and worry. These findings are also consistent with the latest national polls by Gallup and Pew Research Center. Although conservatives generally vary in their beliefs, both political affiliates share significant support for US reduction of greenhouse gas emissions regardless of other countries' positions. Also, a separate but no less significant result found that after reading the conspiracy text, both conservatives and liberals are less likely to believe in the mostly human causes of climate change compared to reading a scientific statement. This strategy is compelling and provokes further inquiry that explores the persuasive effect of conspiracy texts, for better or worse.

Three of the texts above are from widely circulated media sources and the fourth is from a corporate website representing a broad range of sources and messaging techniques. The three texts (*Wall Street Journal*, ExxonMobil, and McKibben) arguing that climate change is mostly caused by humans discuss the environment in terms of climate science and energy. The *Wall Street Journal* is an op-ed written by two conservative political elites. Values like economic growth, minimal government regulation, and American competitiveness are frequently discussed. Similarly, the ExxonMobil corporate team positions itself on the side determined to help working-class Americans and keep America competitive economically; however, while *The Wall Street Journal* targets Republicans, the ExxonMobil statement is designed to reach a larger audience and is thus shorter in length and more ambiguous in its goals.

On the opposite end of the spectrum, liberal environmentalist Bill McKibben's op-ed directly attacks ExxonMobil and its position in limiting government regulations. His text is critical in tone and includes themes of corporate deception. However, there is no significant effect the McKibben text has compared to a scientific statement among liberals or conservatives. Meanwhile, *The Washington Times* text, "The Doctored Science of Global Warming", is similar in tone to McKibben and shares a theme of deception but targets a different audience, one that is more conservative and skeptical. It employs an effective strategy in conveying a message of conspiracy and corruption by government and scientists denying the science behind climate change

Each text was written approximately within one year of the 2016 US election, a tumultuous period of partisan divide. While climate science is supported in three of these texts, the solution to combating the mostly human caused effects of climate change vary. However, these results found that none of them were persuasive. The outlier text written by *The Washington Times* editorial staff expresses a completely different opinion on climate science and was persuasive, but in a negative direction. Together, these four analyses reflect a wide-ranging spectrum of perspectives and objectives. Untangling the similarities and differences among this set of texts reveals the individual nuances that shape attempts of persuasion about climate change and also highlights their lack of persuasiveness among the US public.

## **Appendix 1.**

### ***Scientific Statement (516 words)***

The Intergovernmental Panel on Climate Change is the international body for assessing the science related to climate change. It includes hundreds of leading scientists from around the world. The following statements come from their latest report entitled "Climate Change 2014 Synthesis Report Summary for Policymakers".

Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.

Warming the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.

Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century.

In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate.

Changes in extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold temperature extremes, an increase in warm temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions.

Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks.

Cumulative emissions of CO<sub>2</sub> largely determine global mean surface warming by the late 21st century and beyond. Projections of greenhouse gas emissions vary over a wide range, depending on both socio-economic development and climate policy.

Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme

precipitation events will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and global mean sea level to rise.

Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.

Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are stopped. The risks of abrupt or irreversible changes increase as the magnitude of the warming increases.

***Wall Street Journal (860 words)***

A Conservative Answer to Climate Change.

By George P. Schultz and James A. Baker III, February 7, 2017, *Wall Street Journal*

Thirty years ago, as the atmosphere's protective ozone layer was dwindling at alarming rates, we were serving proudly under President Ronald Reagan. We remember his leading role in negotiating the Montreal Protocol, which continues to protect and restore the delicate ozone layer. Today the world faces a similar challenge: the threat of climate change.

Just as in the 1980s, there is mounting evidence of problems with the atmosphere that are growing too compelling to ignore. And, once again, there is uncertainty about what lies ahead. The extent to which climate change is due to man-made causes can be questioned. But the risks associated with future warming are so severe that they should be hedged.

The responsible and conservative response should be to take out an insurance policy. Doing so need not rely on heavy-handed, growth-inhibiting government regulations. Instead, a climate solution should be based on a sound economic analysis that embodies the conservative principles of free markets and limited government.

We suggest a solution that rests on four pillars. First, creating a gradually increasing carbon tax. Second, returning the tax proceeds to the American people in the form of dividends. Third, establishing border carbon adjustments that protect American competitiveness and encourage other countries to follow suit. And fourth, rolling back government regulations once such a system is in place.

The first pillar, a carbon tax, is the most cost-effective way to reduce emissions. Unlike the current cumbersome regulatory approach, a levy on emissions would free companies to find the most efficient way to reduce their carbon footprint. A sensibly priced, gradually rising tax would send a powerful market signal to businesses that want certainty when planning for the future.

A "carbon dividend" payment, the second pillar, would have tax proceeds distributed to the American people on a quarterly basis. This way, the revenue-neutral tax would benefit working families rather than bloat government spending. A \$40-per-ton carbon tax would provide a family of four with roughly \$2,000 in carbon dividends in the first year, an amount that could grow over time as the carbon tax rate increased.

A carbon dividends policy could spur larger reductions in greenhouse-gas emissions than all of President Obama's climate policies. At the same time, our plan would strengthen the economy, help working-class Americans, and promote national security, all while reducing regulations and shrinking the size of government.

The third pillar is a border adjustment for carbon content. When American companies export to countries without comparable carbon pricing systems, they would receive rebates on the carbon taxes they have paid. Imports from such countries, meanwhile, would face fees on the carbon content of their products. Proceeds from such fees would also be returned to the American people through carbon dividends. Pioneering such a system would put America in the driver's

seat of global climate policy. It would also promote American competitiveness by penalizing countries whose lack of carbon-reduction policies would otherwise give them an unfair trade advantage.

The eventual elimination of regulations no longer necessary after the enactment of a carbon tax would constitute the final pillar. Almost all of the Environmental Protection Agency's regulatory authority over carbon emissions could be eliminated, including an outright repeal of President Obama's Clean Power Plan. Robust carbon taxes would also justify ending federal and state tort liability for emitters.

With these principles in mind, on Wednesday the Climate Leadership Council is unveiling "The Conservative Case for Carbon Dividends." The report was co-authored by conservative thinkers Martin Feldstein, Henry Paulson Jr., Gregory Mankiw, Ted Halstead, Tom Stephenson and Rob Walton.

This carbon dividends program would help steer the U.S. toward a path of more durable economic growth by encouraging technological innovation and large-scale substitution of existing energy sources. It would also provide much-needed regulatory relief to U.S. industries. Companies, especially those in the energy sector, finally would have the predictability they now lack, removing one of the most serious impediments to capital investment.

Perhaps most important, the carbon-dividends plan speaks to the increasing frustration and economic insecurity experienced by many working-class Americans. The plan would elevate the fortunes of the nations less-advantaged while strengthening the economy. A Treasury Department report published last month predicts that carbon dividends would mean income gains for about 70% of Americans.

This plan will also be good for the long-term prospects of the Republican Party. About two-thirds of Americans worry a "great deal" or "fair amount" about climate change, according to a 2016 Gallup survey. Polls often show concern about climate change is higher among younger voters, and among Asians and Hispanics, the fastest-growing demographic groups. A carbon-dividends plan provides an opportunity to appeal to all three demographics.

Controlling the White House and Congress means that Republicans bear the responsibility of exercising wise leadership on the defining challenges of our era. Climate change is one of these issues. It is time for the Grand Old Party to once again lead the way.

Mr. Shultz was secretary of state (1982-89) and Treasury secretary (1972-74). Mr. Baker was secretary of state (1989-92) and Treasury secretary (1985-88).

***Washington Times* (536 words)**

The Doctored Science of Global Warming: Fraud in Pursuit of Politics Undermines Trust in Government Everywhere

By The Washington Times, March 3, 2016, *The Washington Times*

Pure science undertaken for science's own sake is as rare as a rainbow. It's certainly scarce in Washington, where the quest for knowledge is vulnerable to the bias of politics. Skeptics of President Obama's climate change agenda say they see new evidence of fraud. If administration officials are colluding with scientists to cook the evidence, such as it might be, to demonstrate that the planet is warming, the skeptics deserve everyone's thanks.

Whistleblowers within the National Oceanic and Atmospheric Administration (NOAA) complained last year that a major study by agency researcher Thomas Karl, refuting evidence of a pause in global warming, had been rushed to publication. The implication was that the study was coordinated with Obama administration officials to add to the urgency of the president's climate change agenda in advance of the United Nations Climate Change Conference in Paris. Republicans on the House Committee on Science, Space and Technology issued a subpoena of records of NOAA communications dealing with the study.

The inquiry began afresh last month when Rep. Lamar Smith, wrote to NOAA expressing disappointment "with the slow pace and limited scope of the agency's production [of such records]," which had yielded only 301 pages. Mr. Smith directed officials to broaden their search for relevant documents. He said the committee had received a letter signed by 325 scientists, engineers, economists and other scholars questioning whether the agency had properly peer-reviewed the "quality, objectivity, utility and integrity" of the data used in the Karl study.

Data consist of facts, and facts can be cherry-picked to yield a desired effect. In the NOAA study, researchers found that ocean temperatures measured by ships were warmer than those recorded by buoys anchored in place, and scientists "developed a method to correct the difference between ship and buoy measurements." Ship's engines, however, can heat nearby water and produce false readings. By including those values, critics contend, the agency may have effectively erased evidence of the global warming pause.

President Obama's efforts to "re-engineer" the American energy industry is based on the argument that combustion of fossil fuels endangers the planet, and a rapid transition to renewable power sources is essential. The argument was the basis for the Paris climate change agreement, endorsed by nearly 200 nations. If documents were to emerge suggesting temperature data was doctored to reach an expedient conclusion in the NOAA study, and if White House officials were part of such a scheme, that would be proof that science had been recruited to serve politics. Trust in government would be further eroded.

This would not be the first instance of Obama-era back-channel scheming. Republican members of the Senate Environment and Public Works Committee issued a report last summer accusing the Environmental Protection Agency of colluding with the Natural Resources Defense Council

and other “green” organizations to develop the president’s landmark Clean Power Plan, which will saddle Americans with billions of dollars in higher energy bills for decades to come. EPA officials quietly schemed with environmentalists to write regulations reinforcing their shared climate change agenda. The agency has denied the accusations.

***ExxonMobil (152 words)***

Climate / ExxonMobil's perspectives on climate change, Retrieved: March 3, 2017,  
<http://corporate.exxonmobil.com>

Our position on climate change

We have the same concerns as people everywhere – and that is how to provide the world with the energy it needs while reducing greenhouse gas emissions.

The risk of climate change is clear and the risk warrants action. Increasing carbon emissions in the atmosphere are having a warming effect. There is a broad scientific and policy consensus that action must be taken to further quantify and assess the risks.

ExxonMobil is taking action by reducing greenhouse gas emissions in its operations, helping consumers reduce their emissions, supporting research that leads to technology breakthroughs and participating in constructive dialogue on policy options.

Addressing climate change, providing economic opportunity and lifting billions out of poverty are complex and interrelated issues requiring complex solutions. There is a consensus that comprehensive strategies are needed to respond to these risks.



## **McKibben (899 words)**

### What Exxon Knew About Climate Change

By Bill McKibben, September 18, 2015, *New Yorker*

Wednesday morning, journalists at InsideClimate News, a Web site that has won the Pulitzer Prize for its reporting on oil spills, published the first installment of a multi-part exposé that will be appearing over the next month. The documents they have compiled and the interviews they have conducted with retired employees and officials show that, as early as 1977, Exxon (now ExxonMobil, one of the world's largest oil companies) knew that its main product would heat up the planet disastrously. This did not prevent the company from then spending decades helping to organize the campaigns of disinformation and denial that have slowed—perhaps fatally—the planet's response to global warming.

There's a sense, of course, in which one already assumed that this was the case. Everyone who's been paying attention has known about climate change for decades now. But it turns out Exxon didn't just "know" about climate change: it conducted some of the original research. In the nineteen-seventies and eighties, the company employed top scientists who worked side by side with university researchers and the Department of Energy, even outfitting one of the company's tankers with special sensors and sending it on a cruise to gather CO<sub>2</sub> readings over the ocean. By 1977, an Exxon senior scientist named James Black was, according to his own notes, able to tell the company's management committee that there was "general scientific agreement" that what was then called the greenhouse effect was most likely caused by man-made CO<sub>2</sub>; a year later, speaking to an even wider audience inside the company, he said that research indicated that if we doubled the amount of carbon dioxide in the planet's atmosphere, we would increase temperatures two to three degrees Celsius. That's just about where the scientific consensus lies to this day. "Present thinking," Black wrote in summary, "holds that man has a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical."

Those numbers were about right, too. It was precisely ten years later—after a decade in which Exxon scientists continued to do systematic climate research that showed, as one internal report put it, that stopping "global warming would require major reductions in fossil fuel combustion"—that NASA scientist James Hansen took climate change to the broader public, telling a congressional hearing, in June of 1988, that the planet was already warming. And how did Exxon respond? By saying that its own independent research supported Hansen's findings? By changing the company's focus to renewable technology?

That didn't happen. Exxon responded, instead, by helping to set up or fund extreme climate-denial campaigns. (In a blog post responding to the I.C.N. report, the company said that the documents were "cherry-picked" to "distort our history of pioneering climate science research" and efforts to reduce emissions.) The company worked with veterans of the tobacco industry to try and infuse the climate debate with doubt. Lee Raymond, who became the Exxon C.E.O. in 1993—and was a senior executive throughout the decade that Exxon had studied climate science—gave a key speech to a group of Chinese leaders and oil industry executives in 1997, on

the eve of treaty negotiations in Kyoto. He told them that the globe was cooling, and that government action to limit carbon emissions “defies common sense.” In recent years, it’s gotten so hot (InsideClimate’s exposé coincided with the release of data showing that this past summer was the United States’ hottest in recorded history) that there’s no use denying it anymore; Raymond’s successor, Rex Tillerson, has grudgingly accepted climate change as real, but has referred to it as an “engineering problem.” In May, at a shareholders’ meeting, he mocked renewable energy, and said that “mankind has this enormous capacity to deal with adversity,” which would stand it in good stead in the case of “inclement weather” that “may or may not be induced by climate change.”

The influence of the oil industry is essentially undiminished, even now. The Obama Administration may have stood up to Big Coal, but the richer Big Oil got permission this summer to drill in the Arctic; Washington may soon grant the rights for offshore drilling along the Atlantic seaboard, and end a longstanding ban on oil exports. All these measures help drive the flow of carbon into the atmosphere—the flow of carbon that Exxon knew almost forty years ago would likely be disastrous.

We’ve gotten so inured to this kind of corporate power that the report in InsideClimate News received relatively little coverage. The big news of the day on social media came from Irving, Texas, where the police handcuffed a young Muslim boy for taking his homemade alarm clock to school; all day people tweeted #IStandWithAhmed, and rightly so. It’s wondrous to see the power of an Internet-enabled world shining the light on particular (and in this case telling) injustice; there’s a principal and a police chief in Irving that will likely think differently next time. But we badly need the same kind of focus on the long-lasting, underlying abuses of corporate might. As it happens, Exxon is based in Irving, Texas too.

Bill McKibben, a former New Yorker staff writer, is the founder of the grassroots climate campaign 350.org and the Schumann Distinguished Scholar in environmental studies at Middlebury College.