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Global Warming: Why is There Debate?

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Abstract

Previous studies have produced conflicting results for the determining factors of acceptance or rejection of the science behind the global warming phenomenon; some cite religion as a hindrance to the acceptance of this scientific theory [Kilburn 2008], some conclude lack of education is the driving force [Brechin 2003], and some deduce that party affiliation plays the most significant role in determining belief in global warming. In this study, the National Election Survey of 2012 dataset, consisting of 5,916 individual data points from the United States of America, is analyzed to determine the effects of party affiliation on one's belief in global warming, along with variables for education, religion, and age. The study was conducted using a logit model. The results conclude that religiosity and democratic affiliation had a significantly positive effect on one's belief in global warming, while education had a significantly negative effect ($p < 0.01$). Age did not have a significant effect. These unexpected results are worth continued consideration, with the inclusion of research into the characteristics of those labeled democrats versus republicans in this dataset, as these distinctions could point to a shift in the generally accepted definitions of the political parties.

Keywords

Global Warming, Party Affiliation, Education, Religion

Disciplines

Environmental Sciences | Political Science

Comments

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Global Warming: Why is there debate?

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Introduction

Since the scientific community first predicted and discussed the phenomenon known as “global warming” or “global climate change” in 1975 with oceanographer Wallace Smith Broecker’s “Climate Change: Are We on the Brink of a Pronounced Global Warming,” the scientific community and American political community have been at odds over its existence, the predicted severity of the effects and how to address it. As research has continued, the hypothesis of global climate change’s existence and impending occurrence has been supported by the IPCC’s (International Panel on Climate Change) series of reports. The latest report, AR5 published in 2014, concluded that the earth’s average temperature has already increased by .85° C over the period of 1880-2012, that it is extremely likely that more than half of the observed temperature changes seen from 1951-2010 were anthropogenically caused, and that under all proposed emissions reduction plans, the earth will continue to warm with increasing speed; however, the severity of warming is determined by the extent of the emissions reduction plan (IPCC 2014). These theories are widely supported among the scientific community, with nearly 97% of the world’s scientists in agreement.

The scientific community has attempted to share these findings with the general public by producing synthesised reports such as the IPCC’s AR5, producing entertaining forms of education such as television shows like “Bill Nye Saves the World” and documentaries like “Chasing Ice” and Leonardo Dicaprio’s “After the Flood.” However, the sheer existence of the phenomenon of global climate change is still widely debated among a portion of the general public and many influential political representatives currently in office, despite the ever growing mountain of evidential support. So the question then becomes, what is it that causes an individual to disregard evidence and state their conviction that global warming is a “hoax.”

Literature review

When looking at issues regarding the disconnect between science and the public on this topic, a number of factors have been researched. Whit H. Kilburn's 2008 study found that, in a comparison of Americans, those who attend religious service regularly and those who identify as biblical literalists were significantly more inclined to believe global climate change is a natural event and less inclined to be concerned with its consequences than those who are not religious (Kilburn 2008). Conversely, another study found that while religion and pro-environmental attitudes have a significant negative correlation, the same trend did not hold true for questions about global warming or renewable energy development (Olson-Hazboun, Krannich, Robertson 2017).

One study concluded that lack of environmental education plays a large part in differing opinions about global warming, with America scoring below average in a comparison of average environmental education levels of 15 countries (Brechin 2003). However, a later study of partisanship's effects on opinions on global climate change found that the greatest differences in opinions among Democrats and Republicans were among the most educated of both parties, indicating that higher education could lead to greater polarisation on this topic (Brewer 2012). Zia and Todd took a similar approach, studying not only partisanship's effects on opinions about global warming, but also the difference between opinions of people with a college education and those without. They concluded that partisanship had a significant effect on opinions about global climate change, but college education did not increase concern about global warming. (Zia, Todd 2010).

Personal experience has been shown to play a significant role in determining belief in global warming. Experience of odd weather patterns, natural disaster, cooler summers and warmer winters increase likelihood of belief in global climate change [(Shao 2017); (Myers, Maibach, Roser-Renouf, Akerlof, Leiserowitz 2013); (Deryugina 2013) particularly among conservative respondents; (Borick, Rabe 2010); (Joireman, Barnes-Truelove, Duell 2010)]. However, similar studies found the exact opposite of these results; that severe weather had minimal impact on opinions [(Palm, Lewis, Feng 2017); (Carlton, Mase, Knutson, Lemos, Haigh, Todey, Prokopy 2016.)]. Other studies have concluded that these two factors are linked in the opposite direction, meaning belief in global warming significantly affects people's perception of "abnormal" temperature variation [(Howe, Leiserowitz 2013); (Niles, Mueller 2016)]. Either way, this factor can be difficult to track because experience and intensity of experience vary widely from subject to subject; this could contribute to differing results among studies.

Party affiliation is often a great indicator of beliefs, and as such, has been widely studied in association with environmental attitudes. Christopher P. Borick and Barry G. Rabe studied the relationship between belief in Global Warming and party affiliation in 2010 in their article entitled "A Reason to Believe: Examining the Factors that Determine Individual Views on Global Warming." They found that a number of factors contribute to an individual's belief in global warming, including personal observations of weather phenomena, meteorological events, and physical changes of Earth's surface, but the processing of such observations is significantly influenced by one's party identification, with Democrats and Republicans responding differently to the empirical evidence (Borick, Rabe 2010). An integrative literature review conducted by E. DeNicola and P. R. Subramaniam of Ithaca College reported similar findings; that in America,

partisanship is a hindrance to the implementation of emission reduction policies because those who identify as conservative are significantly less likely to believe in global climate change and the severity of its effects (DeNicola, Subramaniam 2014) [Similar results found in (Palm, Lewis, Feng 2017) and (McCright, Dunlap, Xiao 2014)]. A similar study isolated the effects of support for the Tea Party on environmental attitudes, while controlling for democratic or republican party identification, and found that support specifically for the Tea party had significantly increased likelihood of a person's rejection of the existence, anthropogenic cause, and negative impact of global warming (Shao 2017).

A web-study conducted by Jonathon P. Schuldt and Sungjong Roh found that partisanship significantly affected the word association with the phrases "climate change" and "global warming;" finding that Republicans associated words like "warming" and "heat" with "global warming" only, while democrats associated heat-related words equally with both "global warming" and "climate change." This points to a difference in framing and portrayal of this topic among liberal and conservative media sources (Schuldt, Roh 2014). This was supported by Zhao, Rolfe-Redding, and Kotcher's 2016 finding that an increase in media coverage will induce stronger opinions about global warming, but the direction of those opinions is influenced by the party affiliation of the media outlet and the viewer (Zhao, Rolfe-Redding, and Kotcher's 2016) [Similar results reported in (Kim 2011); (Leombruni 2015.)].

Reasoning

It is hypothesized that the Democratic party includes a higher percentage of young people than the Republican party. Republicans tend to be of the "Baby-boomer" generation or older

(born in or before 1965). In recent years, generation-x and the millennials have shown stronger support for the Democratic party, especially for candidates such as former president Barack Obama, Hillary Clinton, and Senator Bernie Sanders. Younger generations are also more likely to feel passionate about environmental conservation and protection. The recent boom in research on the subject would have affected them during their developing years, when values and opinions are more malleable and largely influenced by what is in the media. As people get older, opinions become more rigid and people are less likely to be persuaded by new information.

Education may also have a role to play in the polarisation of the topic of global warming. Since it is theorized that the democratic party tends to be composed of the younger generations, it would follow that they have completed their education more recently than the older republican party. Information is constantly changing in this fast paced world, and as such, topics of education and emphasis of certain values and teachings change over time. The older generations' educational experience would have had less emphasis on global climate change and the impact of things such as carbon emissions because there was less information about it and a wider gap between the scientific community's limited knowledge on the subject and the general public's interest. Recent generations have had the opportunity to learn more about the environment and global warming because new information has allowed for the expansion of the whole subject of natural science.

Finally, it is logical that religion plays a large part in the establishment of personal values. Religion and science have been shown to have a competitive relationship in the past over topics such as evolution; implying that, while they can coexist for some people and some topics, the two tend to have an either/or quality about them. Republicans tend to be more religious, so

this could be influencing their disbelief of global warming's occurrence because religion and science do not often coincide.

Hypothesis

As seen in previous research, partisanship seems to play a large role in determining environmental attitudes. In this study, I will conduct an analysis of the relationship between party identification and belief in global warming's occurrence using the survey data from the 2012 National Election Study. I hypothesize that in a comparison of individuals, those who identify as democrats will be more likely to believe in global warming's occurrence than those who identify as non-democrats because democrats tend to be more educated and less religious. As described above, similar findings have been concluded using other sources of survey data. I expect my findings to also support this claim. These factors will be examined in conjunction with their effect on environmental values.

Variables

In order to test this hypothesis, I will be examining data from the National Election Survey of 2012, which includes responses from 5,916 people from the United States of America. I selected these data because they included variables for belief in global warming (envir_gwarm) as well as in depth demographic information such as age, political party, and religion.

The global warming variable is structured as a question of whether or not the respondent believes global warming is happening. I re-coded the data to reflect 0 as non-belief and 1 as belief.

Table 1. Is global warming happening?

	Frequency	Percent	Cumulative
0. Probably not	1,072	18.55	18.55
1. Probably	4,706	81.45	100.00
Total	5,778	100.00	

The party identification variable (pid_3) is structured as a self assignment of democrat, independent, and republican. For the logit regression, I condensed pid_x into a binary variable (piddum1).

The age variable (dem_age6) is structured as a self assignment into six intervals of 9 years (17-29, 30-39... 60-69,70-older). For the purposes of this study, I re-coded this into a dummy variable of young (<50 years old) and old (50 years or older). The new naming convention for this variable is young_old50, where 3 is young and 6 is old.

For the education variable (dem_educ3), 1 represents high school education or less, 2 represents some college education, and 3 indicates that the respondent holds a college degree or more. I re-coded this into a binary variable (BA_or_not), where 2 represents no college degree and 3 represents college degree or more.

The religion variable (relig_imp) is positioned as a question of whether or not religion is important to the respondent, and coded as 1 meaning yes and 2 meaning no.

The following descriptive statistics show the percentage of people that follow the criteria for the demographic variable and do not believe in global warming versus the percentage of those demographics that do believe in global warming.

Table 2: Descriptive statistics comparing characteristics of believers and non-believers of Global Warming.

	Non-Believer In Global Warming	Believer In Global Warming
Democrat	20.5% [18.3-23.1]	44.3%. [42.8-45.7]
Republican	45.5% [42.5-48.5]	18.8% [17.8-20.0]
Young (defined as <50 years old in 2012)	47.5 % [44.5-50.5]	46.7% [45.2-48.1]
Old (defined as ≥50 years old in 2012)	52.5% [49.5-55.5]	53.3% [51.9-54.8]
College degree (or more)	28.9% [26.3-31.7]	32.1% [30.8-33.5]
Religion is important to respondent	76.5% [73.9-79.0]	67.9% [66.5-69.2]

95 percent confidence intervals in brackets. Data source: National Election Study 2012.

Model Estimation

For my study, I chose to use a logit model because my dependent variable is binary. This will provide me with an estimate of whether or not party identification influences belief in global

warming. If democrats are more likely to believe in global warming, the logit will produce a positive significant value. My logit model also includes the variables for age, education, and importance of religion, which I held at their modes in order to isolate the effects of political identity. The mode for dem_age6 is value 4, which represents those in the 50-59 years old bracket, with 1,312 out of 5,916 observations. The mode for dem_educ3 is 1, which represents those have a high school diploma or less, with 2,065 observations. The mode for relig_imp is 1, which represents those who hold religion as important, with 4,104 observations.

Results

My results are as follows.

Table 3: Effects on likelihood to believe in Global Warming

Democrat	1.165*** (0.0829)
Age Group	-0.00526 (0.0218)
Education	0.127*** (0.0432)
Importance of Religion	0.422*** (0.0810)
Constant	0.340** (0.162)
Observations	5,642

Dependent variable: 0 (doesn't believe), 1 (believes). Results estimated using a logit model. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The logit results show that Democrats are significantly more likely to believe in global warming than non-democrats, as seen by the 1.17 coefficient significant to 99% confidence. Less educated people are also significantly more likely to believe in global warming than more educated people, but only by a minor degree as represented by the meager .13 coefficient (p<0.01). The religion coefficient shows that more religious people are significantly more likely

to believe in global warming than non-religious people (coefficient= 0.42, $p < 0.01$). The influence of age on belief in global warming was not significant. (Table 3).

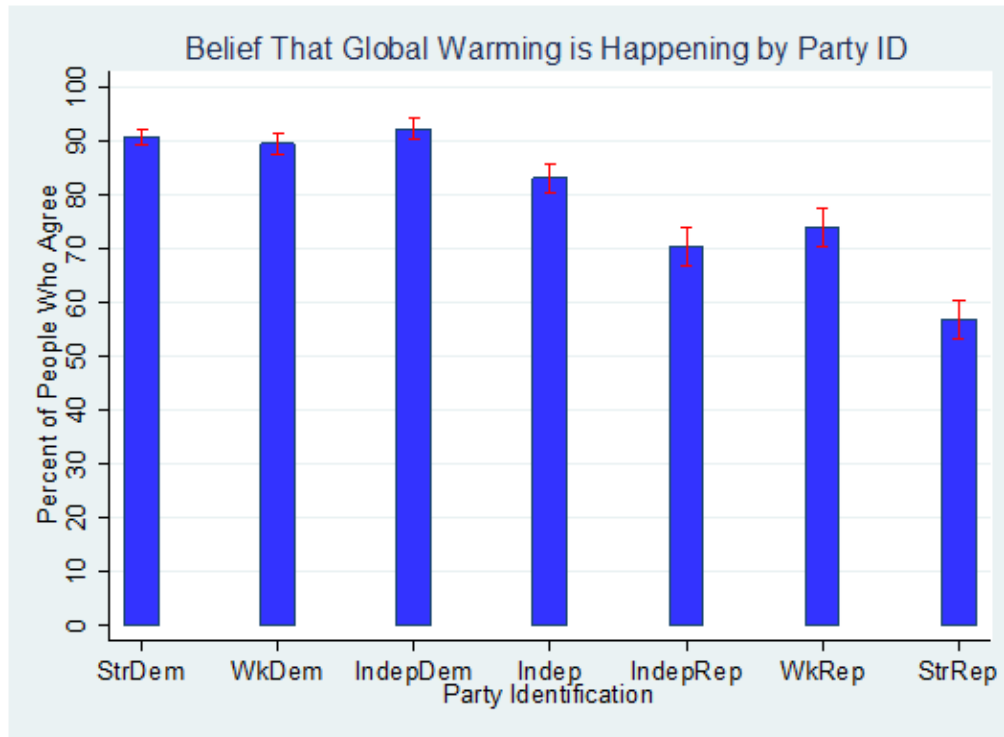


Figure 1: percentage of global warming believers by party identification.

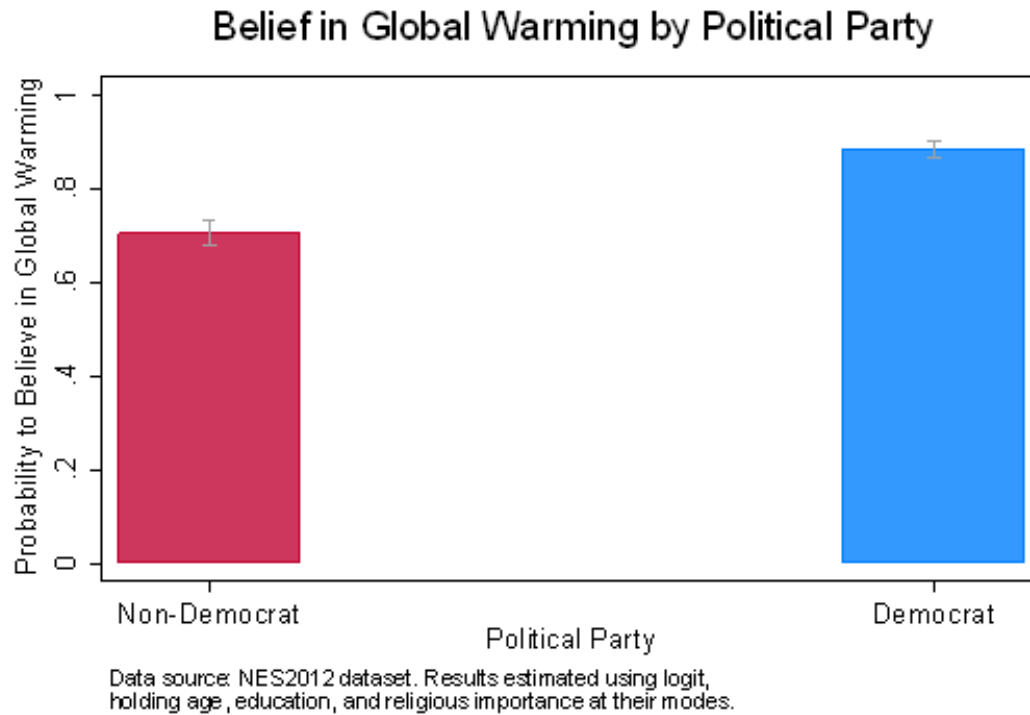


Figure 2: Probability to believe in global warming by Democrat or non-democrat.

As seen in these graphs, democrats are significantly more likely to believe in global warming than non-democrats, as the 95% confidence intervals do not overlap (figures 1 and 2).

Discussion and Conclusions

The overall findings of the influence of political party on global warming beliefs were as predicted; those who identify as democrats are significantly more likely to believe in the occurrence of global warming than those who identify as non-democrats. These results show that being a democrat has a significant positive effect on belief in global warming; however the hypothesized reasoning behind this effect was surprisingly not supported.

I had predicted that the effect that political party had on global warming beliefs was due to the high education levels and lack of religious beliefs in the democratic party, however my

results showed that less educated and more religious people were more likely to believe in global warming. In my research, I came across a few studies that showed no significant effect of education on global warming beliefs, however I did not find any studies that showed less education would have a positive effect on belief in global warming. Similarly, I found a few studies that found the effect of religion insignificant, however I did not find any studies that found religious beliefs to be a positive influence of belief in global warming. These unexpected findings could point to some societal misconceptions about the general characteristics of the Democratic party as compared to other parties.

Expanding upon this study, controlling for economic status and gender would improve this method. It would also be interesting to take this study a step further by investigating the `envir_gwhow` variable, which asks the respondent what they believe the cause of global warming is; 1 represents “mostly by human activity,” 2 represents “mostly by natural causes,” and 3 represents “equally by human activity and natural causes.” Political party could also influence these beliefs, as republicans tend to believe global warming is natural while democrats tend to believe the causes are anthropogenic.

Moving forward, I would also suggest more research into the characteristics of democrats versus republicans in this dataset, as it could point to a shift in the generally accepted definitions of the political parties.

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