Beyond the Politics of Climate Change: How Education and Income Level Affect Environmental Values

Joanna Falla
falla@chapman.edu
Environmental Science & Policy, Political Science
Faculty Mentor: John Compton

Abstract

Human-caused climate change has been acknowledged for decades, but public opinion on its validity and severity has been consistently questioned in the United States. Despite the overwhelming evidence pointing towards fossil fuel emissions and unsustainable practices as the leading causes of global climate change, its politicization during the beginning of the century has seriously slowed down America's path towards a green future. Because this has become a partisan issue for many voters, considerable research has been done on the affiliation between party identification and public opinion on climate change. Although party identification has been studied as a major factor, other variables also come into effect. This paper aims to explore the relationship between how Americans view federal spending on the environment with their income and educational background. We will be obtaining and analyzing data from the 2016 American National Election Survey to see if these variables have statistical significance on how important federal climate change action is to the public. We expect that education will have a larger effect on public opinion than income and that people who want to increase the federal environmental budget will have lower incomes but higher education.

Introduction

Public opinion on climate change is not simply a matter of opinion. Scientific data have pointed to human activity as a leading driver of climate change for decades, but there are still people who do not relate the catastrophic environmental changes to human overconsumption. Despite the overwhelming evidence, climate change has become a matter of opinion instead of fact-based. For the most part, climate change denial is concentrated among a certain kind of demographic in America, mostly due to the extreme politicization of the scientific issue. It is common knowledge by this point that party identification is one of the biggest determinants of whether or not someone believes in environmental science or strong environmental regulation policies. Because party identification is a strong determining variable, it can overshadow some other equally important factors to consider when addressing climate change skepticism or denial. The growing division between political parties has caused demographic groups to feel forced into having a further right or left-leaning opinion on environmental regulations, and this phenomenon is known as polarization.

While some of the public may attribute the beginning of the polarization of climate change to the 2000 Election, parties began drifting apart on environmental issues in the early 1970s (Shipan & Lowry 2001, Lindaman & Haider-Markel 2002). As the public opinion of climate change becomes lost in politics, it is difficult for researchers to understand what other underlying variables make climate change such a contentious issue for Americans. This paper aims to get a better idea of what other demographics can sway one's environmental values, specifically income and education level. It is a privilege to ignore climate change, so income percentile was chosen as a variable because a high-income family can afford to protect themselves from the effects of the worsening climate crisis (i.e. increasing floods, forest fires,

etc.) while a lower-class family may not be able to do the same. Education was chosen as the second independent variable because there are still people who are uneducated or misinformed about climate science and environmental policy. Ultimately, income and education level were selected because there is a population of Americans that are unable to learn about climate change and a population that chooses to ignore it.

Literature Review

While party identification is an indisputably important factor in climate change skepticism, it poses the danger of overshadowing other significant variables that may provide insight as to why so many Americans still have a skeptical or negative outlook on climate change or environmental regulation. What other important demographics should be researched for further work on climate change denial? Does party identification determine one's environmental views? Or are there deeper demographics and factors in one's upbringing that leads them to choose one party over another, thereby changing how dangerous they perceive climate change to be?

Eagan & Mullin (2017) found that some of the biggest determining factors were religiosity and gender, with men and more religious people being more likely to be skeptical about climate change. Other factors like how one views societal relationships (i.e. hierarchical, egalitarian, etc.) and trust in science and media news are also slightly indicative of one's stance on climate change (Leiserowitz 2006, Kahan et al. 2012, Hornsey et al. 2016). Another key factor that the authors brought up is risk perceptions and personal experience and vulnerability, and these factors change someone's willingness to believe in the effects of human-caused climate change.

The risk perception theory does come into play with multiple demographics that could be associated with climate change denial. For instance, multiple research reports have concluded that men are less likely to assess something as risky than women would; perhaps because climate change is seen as less of a risk to men they are more likely to dismiss claims of global warming. While other demographics tend to correlate with some other popular policy decisions, the work done by Eagan & Mullin suggests that these characteristics do not seem to have a strong correlation when discussing public opinion on climate change.

Even though certain commonly-used demographics do not tend to show any sort of significance in one's perception of climate change, the theory of risk perception might suggest that there would be some demographics that correlate more strongly than others. Cognitive frameworks built by one's upbringing and cultural background will most certainly affect one's ability to assess risk, especially with something as abstract as climate change. If one grows up in an affluent community, one is not likely to see the most serious consequences of climate change, and therefore will not associate high risk with something that appears to be low-risk (Mildenberger & Leiserowitz, 2017). Similarly to education, if one is equipped with the scientific knowledge of how human activity exacerbates climate change, then one might consider something like littering to be of a higher risk than someone with less climate science education.

Since most people are not climate scientists, they are tasked with the decision of believing climate science experts or not which, again, may depend on how serious a risk they consider climate change to be. However, just because the majority of the public may not be well versed in climate science does not mean that they refrain from having opinions on climate change. This brings up one more important variable that needs to be discussed: media literacy. People are more prone to siding with media sources that are local, low-temperature news, which

is “a low-quality source of information about the problem, but one that the public strongly associates with climate change.” Even though people may be exposed to warm and high-temperature news (larger media sources with stronger climate change research), the effects are generally short-lived. For example, before and during a large natural event might show an uptick in high-temperature news, but soon after the majority of the public returns back to regularly scheduled programming.

The results obtained from this research were derived from over 35 years of climate change polling starting in the 1980s. The terms surrounding asking about climate change have changed over time; first, it was global warming, then greenhouse effect, then climate change. The surveys have also addressed multiple facets of climate change denial, such as surveying the public’s general climate science knowledge, their belief in climate change, and how high of a risk they think climate change poses to them directly. Fortunately, Bowman et. al (2016) were able to compile the most consistently worded questions over the 35 years for adequate statistical analysis.

The mention of risk perceptions very much relates to the research being done with this project. Because people with less concern for potential risk tend to be more skeptical of climate change, perhaps this behavioral tendency can be seen in other demographics besides gender and religiosity. Past research has shown mixed results when measuring against other demographics like race and age, but there is some research collection on older and white Americans that has been ongoing for decades. Furthermore, perhaps there is some systemic cause relating to risk management with older white Americans as well. An older white American is perhaps more likely to benefit from generational privilege and their resulting financial success. Relating to education, the others refer to the climate scientists as “climate elites” a terminology that might

not sit well with less educated or disenfranchised populations. Perhaps it is language such as this that prevents those who are less privileged to feel comfortable learning more about climate science, believe climate scientists, etc.

To continue to expand on the negative impacts of polarization, McCright & Dunlap (2011) sought to understand why liberals and Democrats are more likely to believe in the scientific community's current understanding of climate change than their conservative and Republican counterparts. Furthermore, liberals and Democrats are more likely to be more concerned about climate change issues (e.g. have a higher risk level associated with climate change). McCright & Dunlap also suggest that other demographics like those who work in the industrial sector are also more likely to side with conservatives and consequently against climate change concerns. The research completed from the 2001-20010 Gallup polls was to explore if the polarization of controversial topics such as climate change stems from something deeper than political affiliation for the general public. Does political identity have as big a role in climate change denial as commonly thought?

The authors venture to say that some of the reasons that made people Republican or Democrat may be the same reasons that they decide to believe in man-made climate change or not. For instance, principles held strongly by Republicans such as limited government and the promotion of free markets (Meyer, 1964) would be more likely to vote against environmental regulations issued by the government onto private and public businesses. Another quality that separates Democrats from Republicans is how they critique the current political system (Fegina, Jost, & Goldsmith, 2010); Democrats are more likely to think the government is not doing enough, while the Republicans prefer to roll back things like environmental regulations. It appears that public opinion on important issues is decided by three main points: 1) political

identity, 2) the level of education and understanding of an issue, and 3) their reactions and beliefs about an issue. To relate this to climate change skepticism, this means that prior knowledge and personal reasoning are the main factors that go along with political parties when assessing the public opinion toward climate change (Wood and Vedlitz, 2007).

The research consisted of the ten Gallup Polls taken before May each year between 2001-2010. Even though the polarization of climate change had been happening long before 2001, they were confined to the years where the questions on climate change were the most consistent. 2001 was also an important date because the Intergovernmental Panel on Climate Change (IPCC) released its *Third Assessment Report* (2001) where it cemented the idea that human activity has caused a significant negative impact on global warming and climate change. Each year thousands of telephone interviews were conducted with participants over 18 to ensure that the sample size each year has between 1,000-1,060 respondents. They also analyzed the respondents' answers through two different lenses in multivariate logistic models; political party by year and political ideology by year.

The results from this article seem to reach virtually opposite conclusions from the work done by Eagan and Mullin (note: the research by McCright and Dunlap was completed about seven years before Eagan and Mullin). McCright and Dunlap argue that while there may be other factors that cause people to lean liberal or conservative, the media and ideology of the two parties cause the polarization of climate change to increase immensely. While liberal media outlets might believe and uplift climate science data, many conservative outlets have done the opposite by encouraging disbelief of the majority climate scientists while highlighting the select few climate science contrarians. Now that both sides have been primed accordingly, the divide goes beyond politics and affects how other controversial issues are understood. Now belief in the

media and climate science is compromised for a large majority of Americans, and that might prove to be disadvantageous since public opinion is largely shaped by educational experience and media literacy.

Despite efforts to increase climate science education and understanding to the general public, there has been little movement on public opinion of climate change and environmental mitigation policies. Is it because of deep polarization between the political parties? Is it some other demographic factor such as religiosity or income that has a larger effect? In the work done by Armstrong, Kransy, & Schuldt (2018), they argue that other psychological theories affect one's social identity and consequently, their ability to believe in climate change. Climate science engagement is not making a significant difference in public opinion, and the answer is much larger than just a lack of education. There are many Americans with varying educational backgrounds that do and do not believe in the severity climate scientists warn about, so what else is stopping them from taking global climate change seriously? Scientific knowledge is just the tip of the iceberg when addressing climate change skepticism.

The author highlights identity theory, which is a group of views or ideas that can bring a community together. For example, one's environmental identity can be how one perceives themselves in the environment as well as how one sees themselves fitting into a group of like-minded individuals. Groups can range in size and importance, from ethnicity and political party to bird watchers and Harry Potter fans. While many ideas are likely shared within the group, other actions or ideas are more encouraged by the group than by the individual. Because of this, social identity can affect the way one processes information. Two people may go to the same conference, but leave with different understandings of the material shared. This is an example of identity protective cognition, which means that one will avoid or reinterpret beliefs

and ideas that might go against the beliefs of one's social identity. While climate change denial might be irrational to a climate scientist, it is completely rational to a group of climate change contrarians.

The authors also discussed other theories to explain why people assess climate change information differently. Science comprehension theory states that if climate change information is understood effectively, then climate change action is sure to follow. Terror management theory posits that to avoid being paralyzed with the terror of impending doom that is climate change, some people will completely shut it out for self-preservation. In a similar vein, cognitive dissonance theory is the idea that people will have major discomfort within themselves if their beliefs and actions do not align, but they will feel discomfort only if they recognize their inconsistencies (which many climate change deniers fail to do). For example, this study showed that higher levels of science literacy were *negatively* correlated with belief in climate change among conservatives, and liberals with higher levels of science literacy were *positively* correlated with belief in climate change.

The study done by Armstrong et. al. was incredibly important for this research to better understand human behavior when confronted with the idea of man-made climate change and the preventive action that needs to happen because of it. Cognitive dissonance only occurs when one realizes one's inconsistencies, but perhaps someone with a lower education cannot deduce that as easily as someone with a better understanding of psychological theories. Along those lines, people with higher income levels can afford to remain ignorant and continue to do unsustainable practices to match their unsustainable mindset. They are less affected by the environmental consequences, so they are less challenged to address inconsistencies in their beliefs or their lifestyle. Lastly, terror management theory can affect anyone in any demographic. The state of

the Earth is rather precarious, and some people would rather look away rather than addressing climate change through their actions or government regulation.

Hypotheses:

H1: If education level is high, then respondents will have a more positive reaction to environmental policy.

H2: If the income level is high, the people will have a negative reaction to environmental policy.

H3: Education level will be of greater significance than Income level.

Data and Methods

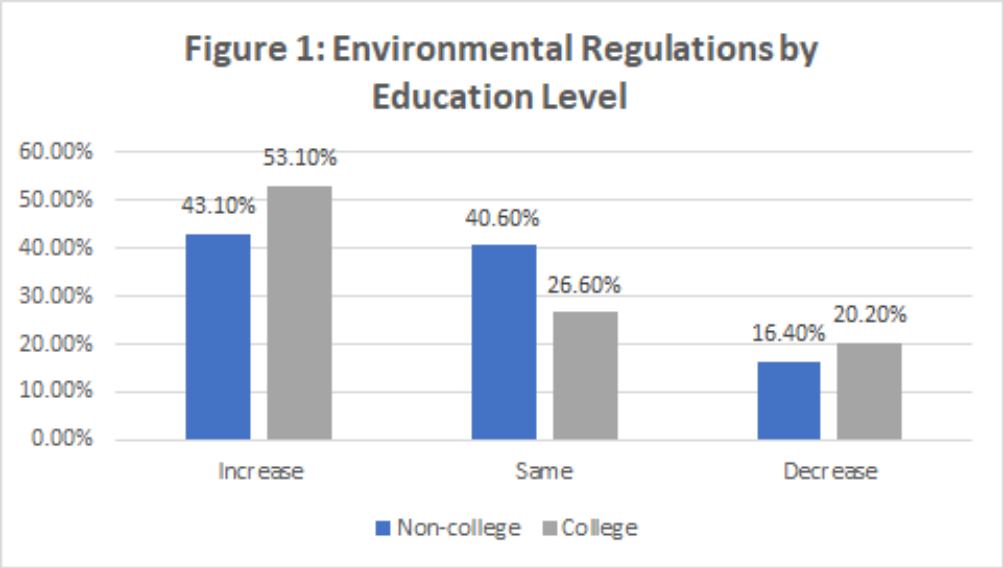
The data used for this research were taken from the Time Series Cumulative Data File (1948-2016) which was compiled by the American National Election Study (ANES). Different policy issues are important every election, so the questions change often to best fit the current political climate. Thus, only questions that have been used for at least three years are included in the cumulative time series. Questions about income level and highest education level have been in the survey since its inception, but questions about man-made climate change and renewable energy have only been used in the last 20 years. There have only been a handful of environment-focused questions that were qualified to be in the dataset, and two of the questions were used as the dependent variables for this study. The first question asks respondents to rate their opinions on environmental regulations on a 7-point scale (1 being against regulations and 7 being in favor), and that question was only used in the years from 1996-2000. The second question measured public opinion on federal environmental spending and whether respondents wanted to keep, maintain, or decrease funding. This question is still in circulation and has been

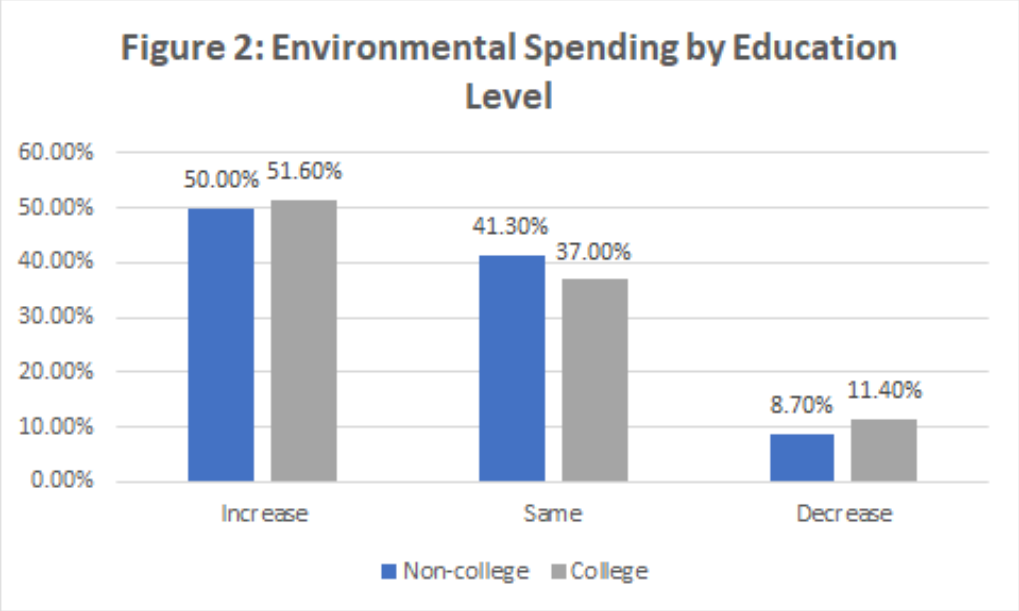
in the survey since 1990. Because the question about environmental regulations has less data, only the public opinion on environmental spending was used to create a time series. The public opinion of both environmental regulations and spending was compared with the education and income level of the respondents. Education level was recoded into two different groups; people who had completed college and those who had not. Income level was broken into five groups for the respondent to describe their total income by income percentile, and this was only recoded to clean the data.

This research includes a statistical analysis through the use of cross tabulations and linear regression analyses to test the significance of education and income level on public opinion toward environmental regulations and spending. The initial 7-point scale for environmental regulations was recoded into three different options: increasing, maintaining, or decreasing regulations. Responses that indicated Don't Know (DK) or "haven't thought much about it" were coded into those who wanted to maintain regulations to see how education or income level might make public opinion stronger (ANES). The question on environmental spending was recoded similarly; it was split into three groups that wanted to increase, maintain, or decrease federal spending on the environment, and those who answered DK were included in the most neutral group.

Results

H1: If education level is high, then respondents will have a more positive reaction to environmental policy.



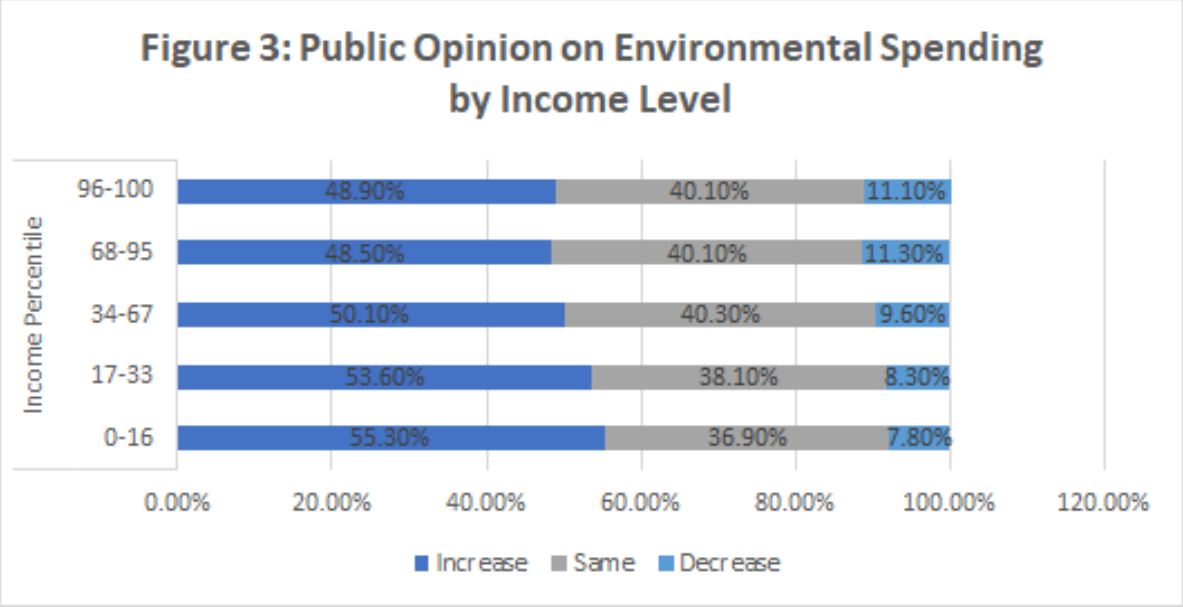


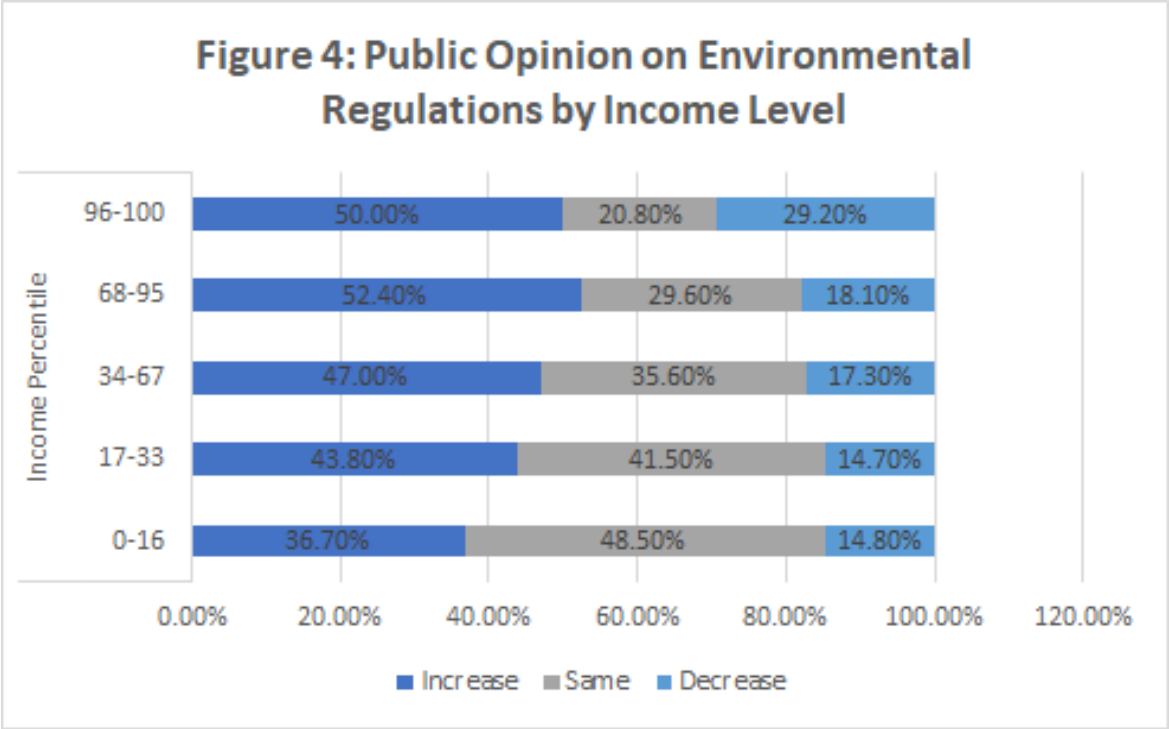
Figures 1 and 2 compare how public opinion on environmental policies changes depending on the education level of respondents. The majority of Americans are relatively split

between increasing and maintaining current environmental regulations and spending. In Figure 1, those who had completed college are more likely to support an increase in federal regulations and spending for the betterment of the environment, but there was also a slight increase in people who supported decreasing regulations as well. Both groups — those who wanted to increase regulations and those who wanted to decrease them — increased in popularity by the same rate, while the group who completed college and wanted to maintain current environmental efforts saw a decrease in popularity.

In Figure 2, it is observed that completing college still had the same effect it had on regulation; the group who had no opinion on environmental spending decreased in popularity while the groups that wanted to increase and decrease spending rose in popularity. Public opinion on environmental regulations changed more dramatically between college and non-college-educated people than it did concerning environmental spending.

H2: If the income level is high the people will have a negative reaction to environmental policy.





Figures 3 and 4 display how public opinion on environmental policies is affected by income level. As the income percentile increases in Figure 3, there is a small but constant decrease in those who want to increase environmental spending. Figure 3 also displays the only data to show an increase in people who DK or were neutral on environmental spending. Roughly the same amount of people felt neutral about spending among all income levels. Other than the slight flip at the highest income level, there is a slightly increasing trend of people who believe in decreasing spending as income level increases. Overall, there is little change in public opinion on environmental spending concerning income level.

Comparable with the results about education level shown in Figures 1 and 2, Figure 4 shows that a greater difference of opinion occurred with the question about environmental regulations than with environmental spending. Another similarity between the education and income level data is that as income level increases, there is a steady decrease in popularity of a neutral response while the popularity of increasing and decreasing regulations both rise. At the

highest income percentile, there is a sudden 11% surge in those who would like to decrease environmental regulations. Support for increasing environmental regulations increased as income level increased except for the high-income percentile where support slightly dips. The percentage of respondents who answered neutrally in Figure 4 was the lowest in the study.

H3: Education level will be of greater significance than Income level.

Table 1: Regression Analysis for Environmental Regulations

Model	**Coefficient (B)**	**Standard Coefficient**	**Significance**
Income	-0.099	**-0.125**	**0**
Education	-0.170	-0.085	**0**
Race	0.50	0.011	0.512
Partisanship	-0.239	**-0.128**	**0**

Table 2: Regression Analysis for Environmental Spending

Model	**Coefficient (B)**	**Standardized Coefficient**	**Significance**
Income	0.018	**0.033**	**0**

Education	-0.023	-0.016	0.081
Race	-0.023	-0.011	0.197
Partisanship	-0.075	**-0.243**	**0**

Table 1 displays a linear regression analysis to determine which variables affect public opinion on environmental regulations. As well as income and education level, race and partisanship were also included because they are prominent social groups that have a very impactful effect on one's public opinion (Hornsey et al., 2016). The R^2 value for the first regression was 0.040. Income level and partisanship were almost equally significant in determining public opinion on regulations due to the nearly identical standardized coefficient. All variables except for race were considered significant. The coefficient for income level conveys that as income level increases, respondents are less likely to have a neutral or no public opinion on environmental regulations.

Table 2 shows the significance of the selected independent variables for public opinion on environmental spending. Income level and partisanship were the only variables considered significant, but partisanship was much more significant in public opinion on spending than income level. Income was positively correlated with environmental spending, which means that as income level increases, there is a more positive public opinion on spending. The R^2 value was 0.063, which means that the chosen independent variables represented the possible variables that contributed to public opinion better for spending than they did for regulations.

Discussion

H1: Education level

Education level was not considered statistically significant for public opinion of environmental spending, which makes sense because it aligns with the minimal differences observed in Figure 4. People who complete a college education are more likely to have a stronger opinion than neutrality on environmental regulations. Overall, a college education means that a person is more likely to want to increase regulations, but it did also lead to a small increase in respondents who wanted to decrease regulations (Figure 1). Because education level was considered a significant factor in opinion on environmental spending, the first hypothesis cannot be fully accepted, thus it was rejected. Education level was recoded as two groups for people who have and have not gone to college, but it had originally been four groups to include grade school, high school, and some college. Climate change education and action is not discussed seriously in many regions of the country until high school, and so perhaps there might be an earlier disconnect in climate science comprehension than a university education (Feierabend, 2016).

H2: Income Level

Income level turned out to be an important statistical factor in determining the public opinion of environmental policies. Similar to education level, an increase in income level caused respondents to have a stronger opinion on regulations (Figure 4). For the wealthiest income percentile, there is a sudden drop in those who had no strong opinion on regulations and a jump

in respondents who wanted a decrease in regulations. As a reminder, the neutral group for both regulations and spending included people who wanted to keep both groups at the current level, but it also included people who did not know or did not care about the issue. So, perhaps the sudden drop in apathy and increase in rolling back regulations at the highest income level is due to the few respondents who create massive amounts of environmental damages through company practices or personal lifestyle.

Adversely, Figure 3 exhibited the only occurrence where income level caused an increase in neutrality when observing public opinion on spending. Even though support for an increase in environmental spending was relatively even with those who were apathetic, it appears that spending was a much less divisive issue for Americans than regulations overall. At the highest income percentile there was a slight rise in support over increasing environmental spending. Those who are above the 95th percentile in gross income make a pre-tax salary of $248,748 annually, so perhaps by that level of financial success one is more predisposed to government spending on environmental issues. Because of the significance of income level in the crosstabs and regression analyses, the second hypothesis can be confirmed.

H3: Significance

Income level was proven to be more significant than education level in the linear regression analysis. This was also observed in the crosstab analysis as creating a bigger difference in public opinion on both regulations and spending by a larger amount. Both significant variables had a negative correlation with increasing regulations, but the overall effect is minimal due to the low R^2 value. As a result of both R^2 values being very low, it is highly

likely that there are many other independent variables that affect public opinion of environmental policies like regulation and spending.

Education level was considered significant for environmental regulations, but not for spending, which makes sense because regulations overall were a much more divisive issue for respondents than spending. The final hypothesis is rejected because education was only considered statistically significant for public opinion on environmental regulations, but it still did not carry as much significance as income level or partisanship.

Conclusions

Overall, there is still a majority positive public opinion on environmental policies, but there is still interesting data on neutral or negative public opinion that could be useful for future research. It was important to include people who did not know and/or did not care about these policy issues because in much of the data results there were twice as many responses from that group as there were for decreasing regulations, so it is an important demographic to understand for environmental policy analysts.

The question about environmental regulations was more divisive than spending; a higher rate of people wanted higher spending than higher regulations, and fewer people wanted fewer regulations. There was already a greater total amount of support for increasing environmental spending than for regulations even before breaking public opinion down by education and income level, so it seems that people are less divided over increasing environmental spending than they are with increasing regulations. Partisanship was the most significant variable for both environmental regulations and spending, which aligns with much of the current research on the topic of environmental public opinion.

For future research, it would be interesting to see how race plays a part in public opinion since low-income BIPOC communities are often more impacted by environmental hazards brought on by climate change. Race was initially considered in this study, but it was discontinued because there were very few non-white respondents interviewed in the cumulative dataset overall so they were not being accurately represented. Race can be very important to one's social identity, and as discussed in the literature review, one's social identity is very important to consider when assessing what independent variables affect one's public opinion on environmental policy. Many other variables create one's social identity and could be explored in future environmental policy research. Variables like media literacy, religiosity, or public opinion on the government may be interesting factors to consider for opinions on environmental policy.

The ANES 1948-2016 cumulative dataset was very helpful, but due to its three-year minimum rule for a question to be included, there are only a few environmental questions in the whole time series. The questions change every year according to what issues are popular at the time, so environmental questions may increase or decrease in the near future depending on the political climate. Because of this, future research should also include more questions on environmental policy and climate change so a more well-rounded observation can be made about public opinion on environmental issues. The interesting results on public opinion of environmental regulations is reason to explore public opinion on specific environmental regulations, perhaps by breaking it down to more specific regulations such as regulations on fossil fuel consumption or land use.

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