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Contextual Support of Environmental Protection

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Abstract

Environmental regulation is often viewed as conflicting with economic needs. This paper examines under what personal and contextual economic conditions individuals support increased environmental protection efforts. Data from the 2017 World Values Survey is analyzed to determine the probability that an individual will prioritize environmental protection over economic growth at varying levels of household income with a comparison between the context of an economically secure country and an economically insecure country. The results indicate that, across all income levels, individuals in economically secure countries are more likely to prioritize the environment than those in economically insecure countries. In a comparison of individuals within economically secure countries, the results do not support a change in an individual's likelihood of prioritizing environmental protection based on household income level.

Keywords

environmental policy, environmental protection, economy vs environment, income level, environmental regulation

Disciplines

Environmental Studies | Inequality and Stratification | Political Science

Comments

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Contextual Support of Environmental Protection

The mitigation of the existential threat of climate change and hazards posed by environmental degradation caused by humans has become a divisive political issue. A healthy and safe earth is generally regarded as desirable, but increased environmental regulations are not always supported, especially when viewed as conflicting with economic needs (Clarke et al. 2009; Singer 2011). Under what conditions do individuals support increased environmental regulations? Individuals may have differing views based on willingness to comply with regulations, level of support for increasing federal spending, political party affiliation, opportunity for public influence and input, and trust in both the ability of the government to accomplish environmental goals and to spend money in the way that it has specified to the taxpayer (Wan et al. 2017). Opinions can additionally be related to policy effects on individuals, such as the perceived equity of outcomes or personal cost of regulation, and may differ in the context of a struggling economy (Wan et al. 2017; Abou-Chadi and Kayser 2017).

While these factors certainly affect an individual's level of support for increased regulation, support can also be based on facets of personal identity. Factors such as gender, level of education, income, and age are often examined in relation to this topic. Age and level of education are consistent predictors of personal viewpoint on regulations, as young people and those with higher levels of education are more likely to support these (Dunlap et al. 2000; Jones and Dunlap 1992; Dietz et al 1998; Israel and Levinson 2004). However, studies concerning

gender and income have come to conflicting conclusions as to how these relate to individual support and action for the protection of the environment (Wan et al. 2017). This paper will investigate the question of income further to determine under what personal and contextual economic conditions individuals support increased environmental protection efforts.

Low income households typically experience greater positive effects of environmental regulation as they are disproportionately affected by these risks. However, they also pay a larger percentage of their income than those of middle or high income and therefore these protections come at a greater cost (Chambers 2017). Due to this, environmental regulations sometimes are not cost effective for all, but despite the higher costs, studies have found that low income individuals may support these protections more than those of higher income (Horpedahl 2018). Reasons for this could be post-materialism, that is, a focus on quality of life over economic survival in the context of an economically secure country, or an irrational rationality (Inglehart 2008; Horpedahl 2018). However, others state that the preferences of high-income individuals are primarily represented in policy and would be more likely to push for environmental protection (Thomas 2019). Other studies have found that personal income matters little in comparison to the state of the economy as a whole (Abou-Chadi and Kayser 2017). The effects of personal income within varying contexts needs to be further examined.

This paper contributes to a greater understanding of under what economic conditions environmental protection will be supported by various income groups, which is beneficial for those attempting to create new environmental protection policies. It will also detail the effects of environmental regulation on individuals of differing income levels and examine the influence of these outcomes on the rationality behind the amount of support individuals may offer to environmental regulation. This is particularly important in the face of climate change which

threatens human existence, in addition to the negative health effects experienced by many due to pollution and other human produced problems (Yu and Stuart 2016). The desire for a safe and beautiful earth is not debated, but how to go about ensuring this is where it becomes more divisive. This is often due to economic considerations but can also be influenced by the fact that environmental change is slow and can be difficult to perceive, giving the appearance of a less than urgent issue (Kollmuss and Agyeman 2002). Additionally, politicians are unlikely to propose environmental regulation if there is low public support and therefore no electoral incentive to do this. Therefore, knowing when to introduce environmental legislation can also have an impact on politician's personal goals (Anderson et al. 2017). Policy makers need to know how to best represent the needs of their constituents, while taking into account what needs to be done to protect the earth. Additionally, this paper will provide an analysis of data regarding public support for environmental protection, based on household income at varying degrees of country-level economic security, which could be used by others in examination of public opinion on this topic.

Effects of Federal Regulations

Environmental protection is generally regarded as desirable and even can be considered a valence issue, but that does not always equate to support of new policies, especially if they seem to be in conflict with economic needs (Clarke et al. 2009; Singer 2011). There is a great deal of conflicting research on how personal income affects support for environmental regulations.

Before examining public support for environmental policy, it is necessary to examine the impact that regulations have on individuals of varying incomes. In general, federal regulations promote higher consumer prices, which have a disproportionately negative effect on low-income households. This is because the households with the lowest income spend larger proportions of

their income on goods and services that are heavily regulated and prone to sharp price increase. For instance, according to the Consumer Expenditure Survey, households in the U.S. that are just below the poverty line spend greater percentages of their incomes on gasoline, utilities, transportation, healthcare, and food than high-income households (Goldstein and Vo 2012). In contrast, higher-income households tend to spend on goods and services that are under fewer regulations (Chambers 2017). Regulation already has a strong presence in many countries, meaning adding more to those already economically burdened may not be well accepted. In the United States, the 2012 Code of Federal Regulations contains over a million restrictions and displays a 28% increase of regulations in fifteen years (Al-Ubaydli and McLaughlin 2015). In relation to the environment, the natural gas distribution industry in the U.S. had a 109% increase in regulations and the water and sewage industry experienced a 125% rise (Chambers 2017). A 10% increase in regulations has also been shown to lead to a 0.89% increase in consumer prices. High levels of regulation create greater costs for everyone in society, but particularly low-income households, which could potentially affect their view of increasing these regulations.

While low income individuals may experience disproportionate costs to regulations, it is essential to examine whether they could be actually cost effective. Considering environmental regulations in general, these restrictions can have regressive effects. One example is that of the U.S. Clean Air Act of the 1970s, which influenced businesses to build smaller plants in low pollution areas. This was a costly venture that created inefficiently sized plants, job losses, reduction in capital investment, and lower outputs (Becker and Henderson 2000; Greenstone 2002). It also resulted in unequal distribution of costs and benefits of improved air quality. Households of the poorest income spent an average of 8.2% of their annual income on complying with these regulations, but received benefits equal to 8% of their household income.

This is because low income households typically suffer disproportionately from pollution (Ash and Fetter 2004; Pearce et al. 2006; Neidell 2004; Jayachandran 2008; Evans and Smith 2005). On the other hand, households of the highest income spent 1.8% of their annual income and received benefits of 1.3% (Gianessi et al. 1979). Additionally, regulatory intervention has been shown to reduce the rate of economic growth, one estimation determining that from 1949 to 2011 this reduction resulted in a GDP loss of 38.8 trillion USD (Dawson and Seater 2013). Additionally, studies have shown a negative relationship between expansion of regulations and economic productivity (Nicoletti and Scarpetta 2003; Djankov et al. 2006; Crafts 2006).

Others argue that while some regulations could be cost effective, many are aimed at reducing such small risks that allocating personal funds toward private mitigation of more pressing issues would be most effective in ensuring health and safety. Billions of dollars are spent yearly on the reduction of life-threatening risks resulting from auto and air travel, air and water pollution, drugs, food, construction, and more. As noted, regulation of health and safety places a greater burden on low income families, as regulation can reduce one's range of choice and crowd out private spending (Chambers 2017; Viscusi 1994). However, the most serious health risks (eg. cancer and heart disease) are affected far more by private decisions, such as diet, exercise, mode of transportation, and pursuing counseling for substance abuse issues (Thomas 2019; Xu et al. 2018). Therefore, the mitigation of small risks is often more costly than beneficial and generally represents the preferences of high-income households, at greater cost to low-income households (Thomas 2019). As death and injury resulting from private decisions occurs at far higher rates than smaller risks (Xu et al. 2018; Keeney 2008; Morrall 2003), these regulations do more harm than good, as they decrease the disposable income of the poor, as studies show additional income is typically spent in ways which lower their private mortality risk

(Evans and Viscusi 1993). A study by Tengs et al. (1995) found that in the U.S., the median cost of healthcare regulation is $19,000 per life saved, but for environmental regulations the median cost is $4,200,000 per life saved. Additionally, according to the Federal Regulation and State Enterprise index, for every 10% increase of federal regulations in a particular state, there is a 2.5% increase in the poverty rate (Chambers et al. 2019). These factors clearly show that at least some forms of environmental regulation are not cost effective for those of low income, who could better protect their health through private mitigation efforts.

Support for Environmental Regulation Based on Individual Income

Paradoxically, some studies suggest poorer Americans are more supportive of regulations than those of middle or high income. However, Horpedahl (2018) notes environmental regulation as an exception to these studies, as they are generally more likely to be supported by higher income individuals. This additionally depends on the specific type of regulation, as low-income individuals are slightly more likely to support limits or bans on drilling for oil but are less supportive of those related to pollution (Horpedahl 2018; Gilens 2013).

Some have considered higher support of regulation among those of low income to be "rational irrationality" (Horpedahl 2018). Rational irrationality is the concept that individuals will hold irrational beliefs about policy if they have preferences over beliefs, and the cost of holding an irrational belief is low (Horpedahl 2018). Generally, high income and middle class individuals agree on policy and it would be more likely for those of low income to have a differing opinion, which begs the question of how often policies actually reflect the desires of low-income households (Branham et al. 2017). From studies by Gilens (2005), Gilens and Page (2014), Bartels (2008), Jacobs and Page (2005), it seems that higher income or elite individuals influence policy the most, though Soroka and Wlezien (2008) state that there generally are not

large differences between the preferences of high, middle, and low income individuals for most issues. If, as these authors suggest, the opinion of low-income individuals is barely taken into account, then even if they do support increased regulations, the cost and benefit of holding irrational beliefs is essentially zero (Horpedahl 2018).

Support for Environmental Regulation Based on Context

Kenny (2020) argues that personal income does not affect an individual's decision on whether or not to support environmental protection policies, finding that GDP (at purchasing power parity) per capita and changing economic growth levels has no effect on environmental protection prioritization (Kenny 2020). Newman and Fernandes (2016) also found, using the 2010 General Social Survey, that individual income has no influence on willingness to make environmental sacrifices. It may instead depend more on the economic conditions of the larger society. People may view environmental protection as a luxury good in a situation of statewide economic instability, in which case they would be forced to prioritize other economic needs (Abou-Chadi and Kayser 2017). Additionally, environmental concerns may seem less pressing as negative effects occur slowly (Kollmuss and Agyeman 2002). A study by Kenny (2020) specifically found that unemployment rates had a strong effect on environmental prioritization globally, results showing that as unemployment decreased, environmental prioritization increased and vice versa. This is supported by Inglehart who stated that economic recessions could have an adverse effect on postmaterialist values, as people prioritize material concerns over those relating to quality of life (2008). These studies all display a lack of connection between personal income and support for environmental protection.

The post-materialism theory of Inglehart should be explored further. He suggests a change occurs in value priorities in the political culture of industrialized societies based on

changing conditions in which generations were socialized (Inglehart 1971). Materialism is focused on survival values, such as economic and physical security, while post-materialism prioritizes autonomy, self-expression, and values which correspond more to quality of life (including greater care for the environment) (Inglehart 2008). According to Inglehart, a change from materialism to post-materialism occurred due to the economic growth and prosperity following World War II, particularly in the form of the welfare state, which created a sense of security for those who grew up during this time and freeing them to move from questions of survival to those of self-expression (Inglehart 2008). This means that in countries which experience high levels of economic security, those who are older typically express material views, while those who are younger tend to express post-material views (Inglehart 2008). In the U.S. specifically, there were twice as many post-materialists than materialists in 2006 (Inglehart 2008). Inglehart states that socioeconomic development is important in that it relates to one's sense of security, not necessarily its effect on personal income level (Inglehart 2008). As post-material values contain support for environmental protection, it makes sense that younger people are statistically more likely to support environmental regulations (Dunlap et al. 2000; Jones and Dunlap 1992). This could also be a reason why low-income households may support environmental regulations that come at a disproportionate cost, if they have a strong enough security and their income is not so low that their primary focus is survival (Chambers 2017; Inglehart 2008).

Another conflicting view is that individual income does affect views on environmental policy, but the way in which it affects these is dependent on feasibility of private mitigation of the consequences of environmental degradation and pollutants, as well as the level of income inequality under various regimes. Hotte and Winer (2012) argue that when private mitigation of

the outcomes of pollution is feasible then income inequality will lead to an unequal distribution of the burden of pollution and serve to polarize the preferences of individuals in public policy. According to Bernard et al. (2014), under intermediate cost of regulation, affordable only to the rich, an increased influence of lower income citizens in the context of a strong democracy will lead to state adoption of stricter environmental protection. If there is a low cost to private mitigation, in which everyone can afford it to some extent, fully democratic regimes are likely to adopt more relaxed regulations than autocratic regimes, as poorer citizens will be less willing to pay the state for protection if they are already protected (Bernard et al. 2014). Under equal choices to privately mitigate by high and low-income groups, typically occurring under low levels of income inequality, the rich prefer more pollution control. However, in the context of high cost private mitigation and high levels of income inequality, the poor are more likely to prefer more state protection against pollution (Bernard et al. 2014). This study indicates that personal income is not a factor in and of itself, but in relation to the state system as a whole and the level of income inequality.

Non-Economic Based Support for Environmental Regulation

Wan et al. (2017) state that income has been such an inconsistent predictor of support for environmental policy that it is more beneficial to examine other factors. The most consistent personal predictors are age and level of education, as youth and those with higher levels of education are most likely to support spending for environmental protection (Dunlap et al. 2000; Jones and Dunlap 1992; Dietz et al 1998; Israel and Levinson 2004). While these are beneficial analyses, the author focuses on the factors of political trust, procedural and distributive fairness, political affiliation, participatory progress, and policy preference as indicators of whether one will support an environmental policy (Wan et al. 2017). It is important to acknowledge that not

only factors like age and income could influence a person's views on regulation, but also beliefs about politics in general.

Causal Explanations and Hypotheses

There is clearly a great deal of disagreement on the extent to which personal income level affects an individual's view of environmental protection as it relates to increased regulations. Support for this could depend on context factors, such as the state of the economy as a whole, the perceived security within a country, the price of private mitigation of risk, or the regime type. It could also relate to personal factors, such as age, level of education, political party affiliation, or level of trust for the government. All of these elements can certainly have an effect on an individual's support for environmental protection, but income will be the focus of this study.

One of the more salient arguments is that of Inglehart (2008), stating that having a sense of security in personal survival will result in a shift from materialist values to post-materialist values. He states that personal income is only a valuable measure in so far as it represents personal security. This could result in higher support for environmental regulation, as values shift to those of quality of life. The lack of cost effectiveness of some regulations for low income individuals may be a negative influence on their support for these, but other regulations may prevent expensive healthcare bills. Low income households also experience more dangerous effects from pollution and are not always be able to afford to move away from areas affected by environmental degradation or take other actions of private mitigation. However, in light of Inglehart's focus on personal feelings of security, I argue that even in an overall economically secure country, low income individuals would be economically insecure and therefore concerns for survival, such as the need for food and shelter, would trump environmental protection. The hypotheses I will test for are as follows:

Hypothesis 1: In a comparison of individuals, those in the context of an economically secure country will be more likely to prioritize environmental protection than those in economically insecure countries.

Hypothesis 2: In a comparison of individuals in economically secure countries, those of low income will be less likely to prioritize environmental protection than those of high income.

Research Design Section

Introduction

In order to test the hypotheses, I examined data from the 2017 World Values Survey. This dataset includes the four years from 2017 to 2020 with 124,854 respondents from 49 countries. I selected this data because I wanted to measure support for environmental protection in a variety of economic contexts throughout the world. I chose this wave of the World Values Survey because it was the most recently published and thus has the most relevant data to the current condition of the world. One limitation is that, due to delays caused by the COVID-19 pandemic, there are 15 to 20 more countries who are expected to return their surveys by mid-2021, making the currently published portion of the survey less representative than previous iterations (WVS Association 2020).

Variable Measurements

In order to operationalize support for environmental protection, I use the protecting environment vs. economic growth variable. This survey question asked "Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own point of view?" Possible responses were "Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs," "Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent," and "Other." Those who answered "Other" were removed from the data. The

mode of this variable is “protecting the environment,” being the response of 60.70% of respondents.

The variable for income was obtained by the survey prompt, “On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in.” The variable was already recoded in the WVS as low, medium, and high income. Its median and mode are both medium income. Table 1 shows individual support for prioritization of either the environment or economic growth based on household income level. There are not large differences in prioritization between income levels, but higher values of income consistently correlate with prioritization of the environment.

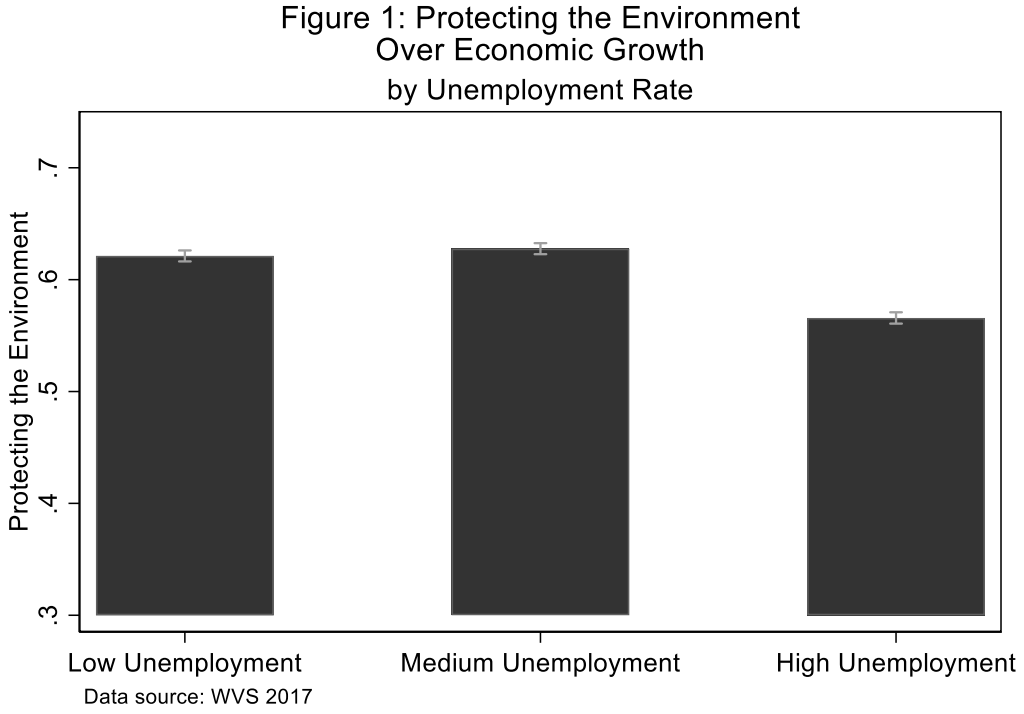
Table 1: Protecting the Environment vs. Economic Growth by Household Income Level

Protecting Environment vs. Economic Growth	Household Income Level			
	Low	Medium	High	Total
Economy over Environment	40.98	39.53	35.32	39.17
Environment over Economy	59.02	60.47	64.68	60.83
Total	100.00	100.00	100.00	100.00

Data source: WVS 2017

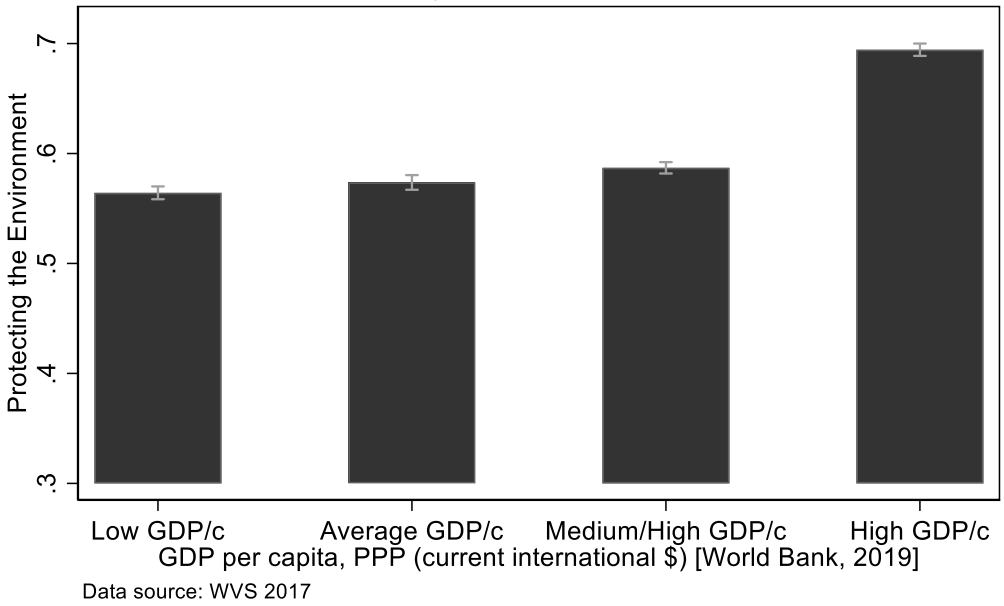
In order to test my hypotheses concerning economically secure countries, this context was determined by three variables, unemployment rates, GDP per capita PPP, and individual life satisfaction. Unemployment rates were measured in terms of the percentage of the total work force and were provided from the World Bank within the WVS dataset. This variable has a range of values from 0.75 to 18.42 with a mean of 6.59, a mode of 4.59, and a median of 4.67. For my purposes, I recoded this variable into three equal quantiles of low, medium, and high

unemployment. Figure 1 shows individual support for prioritizing environmental protection over economic growth based on country unemployment rates.



GDP per capita at purchasing power parity was measured in 2019 international dollars by data from the World Bank that was included within the WVS dataset. Data ranged from 2,311.7 to 129,103.01 with a mean of 31,565.3, a median of 27,875.19, and a mode of 56,052.42. For my purposes, I recoded this into four groups: low (from 2311.7 to 14219.63), average (14495.08 to 20410.71), medium/high (22947.14 to 48709.7), and high (49435.18 to 129104), the median and mode both being medium/high GDP per capita PPP. These groups were created based on data from the World Bank stating that the average GDP per capita PPP in 2019 was 17,673.11 in 2019 international dollars (World Bank Group 2019). Figure 2 displays individual support for protecting the environment over prioritizing economic growth based on GDP per capita PPP.

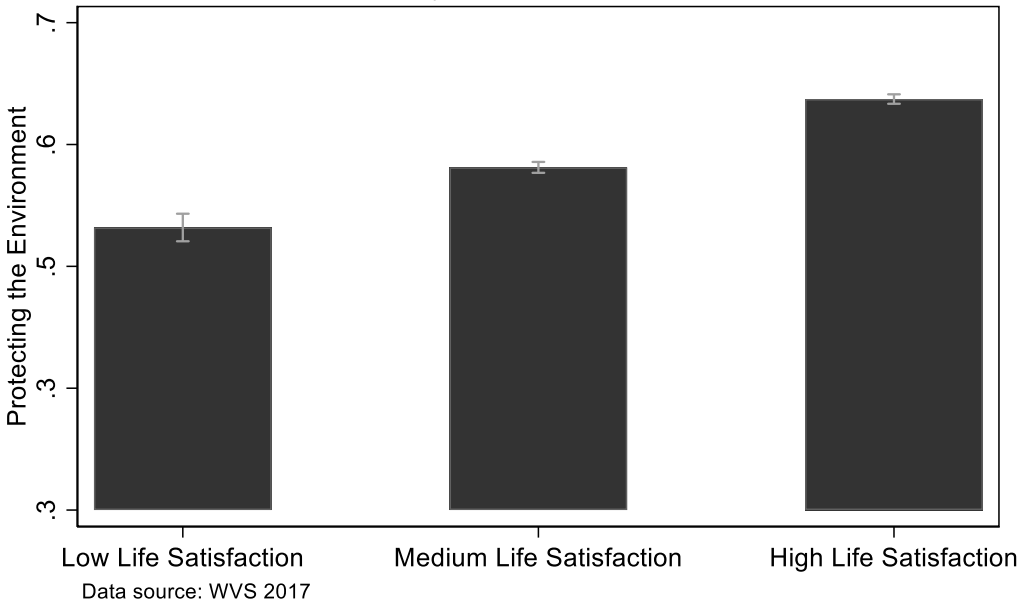
Figure 2: Protecting the Environment Over Economic Growth by GDP per Capita



Data source: WVS 2017

Life satisfaction was measured by the survey question, "All things considered, how satisfied are you with your life as a whole these days?" Responses were scored on a scale of 1 to 10, with 1 as "completely dissatisfied" and 10 as "completely satisfied." The mean of this variable is 7.23, the mode is 8, and the median is also 8. For my purposes, I recoded this variable into three groups, 1-3 as "low life satisfaction," 4-7 as "medium life satisfaction," and 8-10 as "high life satisfaction" the median and mode both being high life satisfaction. Figure 3 shows individual support for prioritizing environmental protection over economic growth based on individual life satisfaction.

Figure 3: Protecting the Environment
Over Economic Growth
by Life Satisfaction



Model Estimation

I chose logistic regression as the statistical model because my dependent variable, protecting the environment vs. economic growth, is a binary variable. I ran a logistic regression twice to measure the effect of various income levels on the probability of choosing to protect the environment over economic growth, within the context of an economically secure country and an economically insecure country. To accomplish this, I used the independent variable of income, while holding unemployment, GDP per capita PPP, and life satisfaction at constants. To measure this within the context of an economically insecure country, unemployment was held at high; GDP per capita PPP was held at low; and life satisfaction was also held at low. Analysis within an economically secure country was accomplished by holding unemployment at low and life satisfaction at high. GDP per capita PPP was recoded to combine medium/high and high into one value, at which this variable was held constant.

Results

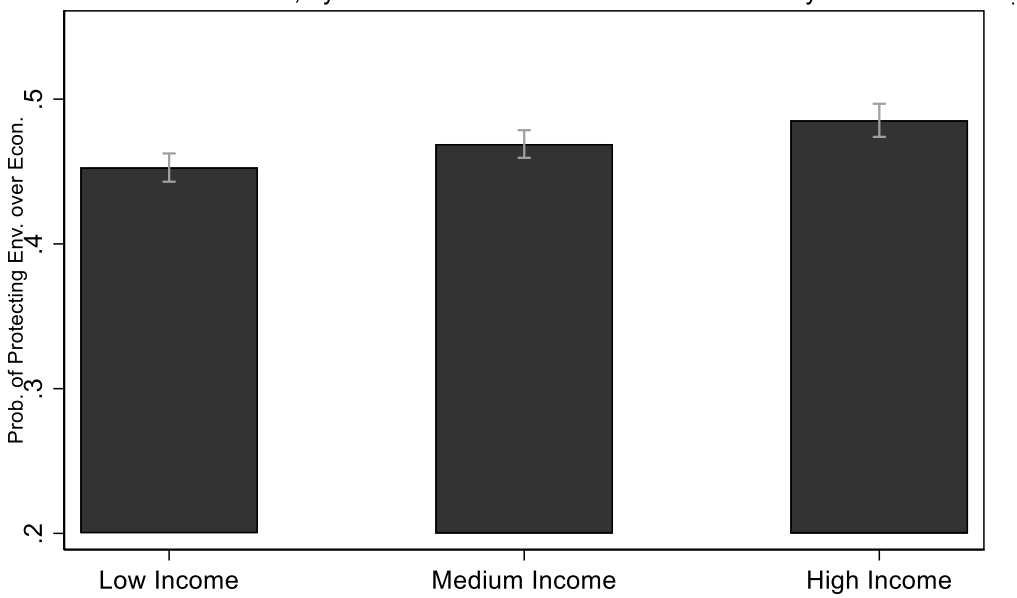
Model 1: Probability that Individual Prioritizes Environmental Protection over Economic Growth

Table 2: Logistic Regression for Probability of Protecting Environment Over Economic Growth	
Variables	Environment vs. Economy
GDP per Capita PPP	0.126***
	(.0075)
Unemployment	-0.107***
	(.0079)
Life Satisfaction	0.202***
	(.0105)
Household Income	0.065***
	(.0099)
Constant	-0.260***
	(.0375)
Observations: 102,438	
Standard error in parentheses, ***p<.01	

This model confirms the correlation seen in table 1 and figures 1-3 between household income, unemployment, GDP per capita PPP, and life satisfaction on support for protecting the environment over economic growth. The positive coefficients in GDP per capita PPP, life satisfaction, and household income show that an increase in any of these variables will result in an increase in support for environmental protection. The strongest effect is seen in life satisfaction with a coefficient of 0.202, meaning that for every 1-point increase in life satisfaction, the likelihood of prioritizing the environment increases by 0.202. Unemployment displays a negative correlation with prioritization of environmental protection, due to the negative coefficient. All four of these variables had statistically significant results with p-values all below 0.01, rejecting the null hypothesis.

Model 1: In Context of Economically Insecure Country

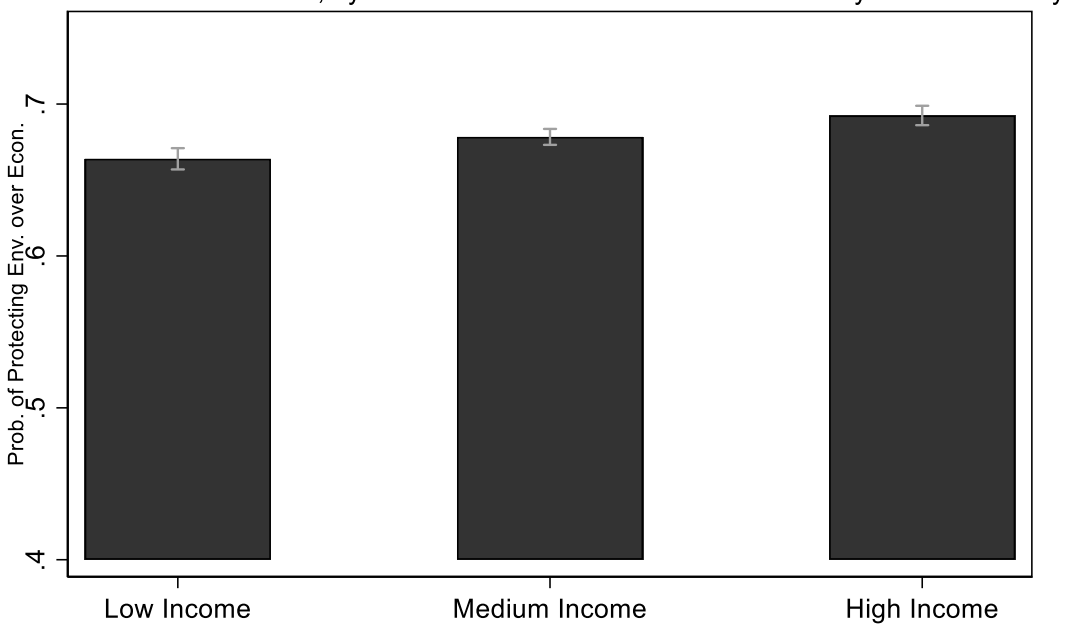
Figure 4: Probability that an Individual Protects Environment
Over Economic Growth, by Household Income Level in Economically Insecure Countr



Data source: WVS 2017. Results estimated using logistic regression,
holding GDP per capita, Unemployment, and Life Satisfaction at constants

Model 1: In Context of Economically Secure Country

Figure 5: Probability that an Individual Protects Environment
Over Economic Growth, by Household Income Level in Economically Secure Country



Data source: WVS 2017. Results estimated using logistic regression,
holding GDP per capita, Unemployment, and Life Satisfaction at constants

In a comparison of the two figures, it is clear that no matter the income level, individuals within economically secure countries are overall more likely to prioritize environmental protection than those within economically insecure countries. Low, medium, and high income in figure 4 have probabilities of 0.453, 0.469, and 0.485 respectively, while in figure 5 low, medium, and high income have probabilities of 0.664, 0.678, and 0.692 respectively. These results are moderately substantive and support the first hypothesis.

Figures 4 and 5 show the probabilities of prioritizing environmental protection over economic growth at varying income levels. In figure 4, the differences between low and medium income, and medium and high income are not statistically significant, due to overlapping confidence intervals, but the difference between low and high income is significant. The second hypothesis stating that in economically secure countries, individuals of low income will be less likely to prioritize environmental protection than those of high income is slightly but not substantively upheld by figure 5. In this graph, the differences between low, medium, and high income do not have overlapping confidence intervals and are therefore all statistically significant. Though statistically significant, figure 5 does not provide meaningful results for the second hypothesis.

Discussion and Conclusion

A country's level of economic security had a clear effect on individual prioritization of environmental protection over economic growth across all income levels, seen through the comparison of figures 4 and 5. Those within economically secure countries were overall more likely to prioritize the environment than those within economically insecure countries, though this effect was only moderately substantive. These findings confirm my first hypothesis that in a

comparison of individuals, those in the context of an economically secure country will be more likely to prioritize environmental protection than those in economically insecure countries.

There were statistically significant differences between all income levels in the context of an economically secure country, as well as between low and high income levels an economically insecure country. However, these differences were so small that they are not substantive findings. The data is not strong enough to support the second hypothesis that in a comparison of individuals within economically secure countries, those of low income will be less likely to prioritize environmental protection than those of high income.

These findings help to confirm Inglehart's post-materialist theory that feelings of personal security result in holding more values related to quality of life, such as support for environmental protection (1971). I examined only economic security, but there are many other factors which relate to personal security, such as access to public services and a country's political situation. Further research should include a wider variety of contexts, particularly welfare states versus those which are not, as Inglehart notes the influence of the welfare state on feelings of personal security (2008). I did not find substantive results of difference in prioritization of the environment versus economic growth across income levels within an economically secure or insecure country, which is a point of conflict in existing research. It is possible that income could have larger effects in areas where people are more reliant on private mitigation of the negative effects of environmental degradation, which should also be researched further. It would also be beneficial to analyze this in previous World Values Surveys that have a larger number of countries included in the dataset. Understanding in which contexts individuals will display greater support for environmental protection can aid policy makers who seek to advance these types of policies, while also acting in the best interests of their constituents.

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I affirm that I have upheld the highest principles of honesty and integrity in my academic work and have not witnessed a violation of the Honor Code. Emma Groff