PREDICTING ENVIRONMENTALLY-FRIENDLY BEHAVIOR:

DOES POLITICAL IDEOLOGY AFFECT WILLINGNESS TO CHANGE BEHAVIOR TO HELP IMPROVE THE ENVIRONMENT?

A Thesis

Presented to the faculty of the Department of Public Policy and Administration

California State University, Sacramento

Submitted in partial satisfaction of
the requirements for the degree of

MASTER OF PUBLIC POLICY AND ADMINISTRATION

by

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SPRING
2012

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Department of Public Policy and Administration

Abstract

of

PREDICTING ENVIRONMENTALLY-FRIENDLY BEHAVIOR:

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Statement of Problem

Scientists and researchers argue that overconsumption of resources and continued pollution from human activities have created a variety of environmental problems including deforestation, loss of biodiversity, changes in climate, loss of open space, poor water quality, and poor air quality (Vitousek, 1993, Gershon, 2009). Solving these problems is going to require that people practice environmentally-friendly behaviors such as recycling, driving less, conserving water and conserving land. I use regression analysis to examine people's willingness to change some of the things they do to help improve the environment with a focus on the influence of political ideology.

Sources of Data

The data used in this thesis is from the ABC News/Stanford University/Washington Post Survey on Global Warming conducted in April of 2007. ABC News, Stanford

University, and Washington Post conducted the survey of 1,002 United States residents via phone interviews through random-digit dialing.

Conclusions Reached

After controlling for knowledge and attitudes about the environment, demographic characteristics, support for environmental policy, and recycling law being required in the community, multiple regression analysis results show that political ideology is not a significant predictor of how willing people are to change some of the things they do to help improve the environment. Instead, I found that the more people think something can be done to reduce future global warming the more wiling people are to change their behavior to help improve the environment. The other variables that turned out to be significant predictors of willingness to change behavior include being Hispanic, having kids under the age of 18 living at home, and favoring a gas tax as a way to reduce future global warming.

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Date

ACKNOWLEDGEMENTS

First, I sincerely thank my husband Eric for his continuous encouragement and patience throughout my educational pursuits. His humor and support helped me immensely in writing this thesis. Without him, I would have lost my sanity long ago.

I would also like to thank Dr. Su Jin Gatlin Jez and Dr. Mary Kirlin, my thesis advisors, for always being available and responsive to my many questions throughout this process. Their excellent comments, questions and feedback helped me write a stronger thesis. The Public Policy and Administration Department is full of amazing faculty and students who have all helped me greatly during my three-year journey of pursuing this Master's degree, and I will always be thankful for the relationships I have made over these years.

Last, but certainly not least, I am grateful for the support my parents and sister have given me over the past few years. I have not been able to visit them as much as I would have liked to in recent years, but they were always understanding and continued to encourage me to focus on school. Thank you all for everything you have done to make this thesis possible.

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CHAPTER 1
INTRODUCTION

People have discussed and debated environmental issues and the solutions to them for decades. Scientists and researchers argue that overconsumption of resources and continued pollution from human activities have created a variety of environmental problems including deforestation, loss of biodiversity, changes in climate, loss of open space, poor water quality, and poor air quality (Vitousek, 1993, Gershon, 2009). Scientists predict that sea level rises, reductions in crop yields, increased floods, loss of land, and reductions in fresh water resources will be just a few of the side effects of climate change (IPCC, 2007). With scientific evidence continuing to show that human behavior affects water quality, water supply, land use, air quality, and climate change (IPCC, 2007; Vitousek, 1993), policy makers are beginning to take more interest in the subject of environmentally-friendly behavior change (Barr, Glig & Shaw, 2010; Crompton, 2008; Darnton et al., 2006; Gershon, 2009; Stern, 2000).

The United States Environmental Protection Agency (2012) encourages a plethora of environmentally-friendly behaviors such as conserving water, keeping soap out of the gutters, conserving energy, using fewer pesticides and reducing vehicle use. Policy makers and public organizations continue to consider what government can do to encourage people to practice these environmentally-friendly behaviors. Should government do anything, or will we find technological solutions to environmental problems through the free market? Which factors motivate people to act in environmentally-friendly fashions, and are those factors something that government can

influence? These are just a few of the questions that social scientists from many disciplines have attempted to answer in the past four decades.

I am interested in determining if there is a significant relationship between political ideology and willingness to change behavior to improve the environment. Are people who are ideologically liberal more willing to change some of the things they do to improve the environment than people who are ideologically conservative? Researchers have examined the relationship between political ideology and environmentally-friendly attitudes assuming that attitudes will lead to environmentally-friendly behavior (Kollmuss & Agyeman, 2002), but few have examined the direct relationship between political ideology and environmentally-friendly behavior.

While not quite the same as examining the affect of political ideology on environmentally-friendly behavior, Borek & Bohon (2008) examined the impact of "policy climates" on people's frequency in reducing vehicle use for environmental reasons. The researchers measured policy climates in the European Union by the number and type of federally enacted environmentally-friendly policies, a government's participation in international cooperative efforts at reducing global climate change, and national provisions or subsidies for energy and material use. Governments with the highest frequency in reducing vehicle use for environmental reasons were the countries that had more environmentally-friendly policies, participated in cooperative efforts at reducing climate change, and had more subsidies for energy and material use.

Similar to Borek & Bohon (2008), I am interested in examining the impacts of politics on practicing environmentally-friendly behavior. Specifically, I examine whether

or not political ideology affects willingness to change behavior to help improve the environment. To do this, I use survey data from the April 2007 ABC News/Washington Post/Stanford University Global Warming Poll to examine the impact of ideology on people's willingness to change some of the things they do to help improve the environment. I use regression analysis to examine this relationship, controlling for variables including age, education, gender, income and a variety of other demographic characteristics, attitudes and knowledge about the environment, as well as political and economic influences on individuals' willingness to change behavior for the environment. In the following sections of this chapter, I discuss environmental issues and the role of government, the significance of willingness to change behavior as it relates to environmental policy objectives, and I describe how this thesis is organized.

Environmental Issues and the Role of Government

Economists consider environmental problems such as air pollution, water pollution, and rapid changes in climate, negative externalities that are a result of the market's failure to incorporate these costs into the economy (Munger, 2001). In the case of climate change, the market has failed to account for the ecological and social costs of emitting greenhouse gases into the air. Since the market has failed to account for these costs and the sources of pollution and overconsumption are so diverse, public policy can be an appropriate tool to address climate change, air quality, water quality and other environmental issues.

The challenge is that environment problems are often very complex and difficult to address especially when using one specific policy. Using climate change as one

example, activities such as driving, using energy (home and office), consuming food, purchasing products, and traveling, all add to greenhouse gas emissions. States such as California have passed legislation to address poor air quality, poor water quality and most recently, climate change. California's Assembly Bill 32 (AB 32), the Global Warming Solutions Act, was passed in 2006, and requires that California reduce its greenhouse gas emissions to 1990 levels by the year 2020 (ARB, 2011). CalEPA's Air Resources Board (ARB) is the organization charged with identifying strategies to reduce greenhouse gas emissions (ARB, 2011) and one aspect of implementing this law will involve getting individuals to modify their behaviors in ways that will reduce greenhouse gas emissions.

The California Air Resources Board (ARB) has identified potential reductions in greenhouse gas emissions through the development of a cap-and-trade program, clean energy projects and vehicle-emission target setting. While ARB does not explicitly mention "environmentally-friendly behavior" in its scoping plan's recommended measures to reduce greenhouse gas emissions, one can read that programs such as Million Solar Roofs and Advanced Clean Cars aim to encourage businesses and consumers to install solar roofs and produce/drive advanced clean cars (ARB, 2008). Through ARB's Cap-and-Trade Program, refineries, power plants, transportation fuels, and industrial facilities will need to operate under a greenhouse gas emissions cap that will decline over time in an effort to encourage ever-increasing efficient use of energy (ARB, 2008).

Not all economists agree that government should create environmental protection policies, especially since these policies could stifle economic growth and may not succeed in efficiently reducing emissions (Brady, 2011). Economist Bjorn Lomborg

(2005) argues that innovation and economic prosperity will allow future generations to address climate change through the creation of new technologies. If we stifle economic growth, he argues, we might end up leaving future generations with less wealth than they might otherwise have had. While these concerns are understandable, climate scientists at IPCC (2007) argue that mitigation actions could result in near-term co-benefits (such as improved health from reduced air pollution and increased water reserves from conservation efforts), and that these benefits will off-set other mitigation costs. Additionally, mitigation actions could help us reduce, delay or avoid some of the future impacts of climate change (IPCC, 2007) which could further reduce future mitigation costs.

Encouraging Environmentally-Friendly Behavior

Ecologists, political scientists, economists, sociologists, psychologists and experts from other disciplines continue to debate the best approach to encouraging behavior changes that will improve the environment. Until recently, most research related to environmentally-friendly behavior change focused on behavior at the individual level. Researchers sought to understand why people practiced environmentally-friendly behaviors and what specific factors influenced their behavior choices (De Young, 1986; Klineberg, McKeever, & Rothenbach, 1998; Kollmuss & Ageyman, 2002). Acknowledging the realities of economic decisions, many behavior theories argue that people make rational choices based on the information available to them at the time (Kollmuss & Ageyman, 2002; Welsch & Kuhling, 2010). Researchers therefore argued that getting people to reduce water or to conserve energy was as simple as educating

people that overconsumption of these resources is happening and tell them what they can do to help improve the situation.

As such, many of the strategies for encouraging environmentally-friendly behaviors have focused on information intensive campaigns and economic incentives aimed at individual consumers (Crompton, 2008; McKenzie-Mohr, 2002). Environmental organizations use education intensive campaigns to inform people about environmental problems and make them aware of actions they can take to address the problems (Crompton, 2008; McKenzie-Mohr, 2002). Companies encourage people to buy green products by highlighting the financial benefits of purchasing energy efficient products (Crompton, 2008) such as air conditioning units and light bulbs. The California Air Resources Board's Million Solar Roof program uses financial incentives such as rebates to encourage the installation of solar products on rooftops (CARB, 2008).

Researchers have often found, however, that getting people to change behaviors is much more difficult than simply providing information or financial incentives (Blake, 1999; Crompton, 2008; Gershon, 2009; Kollmuss & Ageyman, 2002; Oskamp, 2010; Stern, 2005). Crompton (2008) and Gershon (2009) argue that the limitation of these targeted marketing techniques is that they do not focus on individuals' underlying values regarding the environment. Crompton (2008) points to evidence that promoting environmentally-friendly behaviors might be more effective if campaigns focus on intrinsic motivators such as environmental values, as opposed to the extrinsic motivators of financial incentives. This focus on intrinsic values will create longer-lasting and more widespread environmentally-friendly behavior change (Crompton, 2008; Gershon, 2009).

Given this information, I am curious to know if people are motivated by political ideology to practice environmentally-friendly behaviors. Perhaps people would be willing to change more of their behaviors in order to improve the environment if it is something with which they philosophically and ideologically agree. For example, is it possible that people who are more politically liberal and tend to support environmental policies are more willing to change some of their own personal behaviors in order to improve the environment? Alternatively, are politically conservative people more willing than their liberal counterparts are to change some of their behaviors to improve the environment? Theodori & Luloff (2002) found that liberals were more likely than conservatives were to maintain pro-active positions on the environment and that the people who held these positive pro-active positions on the environment were more likely to engage in environmentally-friendly behaviors. In this thesis, I test the direct relationship between political ideology and willingness to engage in environmentally-friendly behaviors.

Since it is becoming increasingly clear that solutions to environmental issues will require individuals to modify their behavior, I focus my research on examining the ways in which political ideology affects people's willingness to practice environmentally-friendly behaviors and how we might be able to use this information to encourage behaviors that reduce negative environmental impacts. My hypothesis is that politically liberal people are going to be more willing than politically conservative people are to change some of the things they do to improve the environment since other researchers have found that liberals are more likely to hold pro-active positions on environmental

issues and support environmental policies (Klineberg et al., 1998; Theodori & Luloff, 2002).

Outline of Thesis Chapters

For this thesis, I conduct a regression analysis to examine the relationship between political ideology and people's willingness to change some of the things they do to help improve the environment. I also examine the relationship between willingness to change behavior to help improve the environment and other indicators including age, education, income, homeownership, environmental attitudes, and race. This analysis, along with a review of relevant literature on the topic of environmentally-friendly behavior change will allow me to provide some recommendations to policy makers, public officials and non-profit leaders regarding the role of political ideology in promoting environmental behavior change. This thesis provides insight into the question of whether changing behavior to improve the environment is a purely partisan issue or whether people of all ideologies are willing to modify their behavior to benefit the environment.

In the following chapter, I provide an overview of literature that examines many variables found to be significant predictors of environmentally-friendly behavior. In Chapter 3, I outline the methodology I use to analyze the survey data including an overview of regression analysis, data coding, and the limitations of regression analysis. I report and analyze the results from the regression analysis in Chapter 4 beginning to form initial recommendations for elected officials and staff who are writing and implementing policy as well as for public managers implementing environmental programs and non-

profit organizations seeking to encourage environmentally-friendly behavior. Finally, I will conclude with major findings and recommendations regarding the influence of political ideology on willingness to change behavior to help improve the environment in Chapter 5.

CHAPTER 2
LITERATURE REVIEW

The amount of research that examines the factors that influence environmentally-friendly behavior is vast and diverse, branching into many different disciplines (e.g., Barr, Gilg, & Shaw, 2010; Corbett, 2005; Darnton, 2008; Darnton, Elster-Jones, Lucas, & Brooks, 2006; Gershon, 2009; Hargreaves, 2011; Kaiser, Ranney, Hartig & Bowler, 1999; Klineberg, McKeever & Rothenbach, 1998; Kollmuss & Agyeman, 2002; Oskamp, 2000; Stern, 2000; Quimby & Angelique, 2011). Psychologists, sociologists, economists and political scientists have used and developed a variety of models and theories in an effort to explain what motivates people, organizations and societies to change behavior, and in recent years have focused on applying these models and theories to promoting environmentally-friendly behavior change (Darnton et al., 2008). In this thesis, I do not synthesize all the literature on behavior change as it stretches from individuals, to organizations, and to society as a whole. Instead, I focus on the individual socio-psychological research partly to keep the thesis to a reasonable scope, but also because individuals are often agents of changes that can affect change within organizations and governments. While I do provide a brief overview of the influence that support for environmental policy has on individual behavior, I recommend that researchers continue to examine the ways in which individual, organizational, and societal factors interconnect and influence one another.

In this chapter, I summarize what variables researchers have found to influence individuals to practice environmentally-friendly behaviors into three categories; knowledge and attitudes about the environment, demographic characteristics, and the

influence of economic and environmental policy on individual behavior. The environmentally-friendly behaviors examined in the studies below include:

- Driving less (Borek & Bohon, 2008; Corbett, 2005; Kaiser et al., 1999),
- Recycling and reusing materials (Klineberg et al., 1998; Hopper & Neilsen, 1991)
- Purchasing "green" products such as those that are recycled, made using fewer resources (Scott & Willits, 1994)
- Joining clean-up drives (Scott & Willits, 1994)
- Attending environmental organization meetings (Scott & Willits, 1994)
- Avoiding environmentally-damaging products (Klineberg et al., 1998)
- Giving time or money to an environmental group (Klineberg et al., 1998)
- Supporting taxes on gas or electricity (Kaiser et al, 1999)

The studies I review in this section examine the relationship between these environmentally-friendly behaviors and variables related to knowledge and attitudes about the environment, demographic characteristics, and the influences of economic and environmental policy on individual behavior. Researchers have explored variables such as altruism, political ideology, age, gender, income, education level and environmental regulations. I use this research to inform the regression equation used in this thesis.

Knowledge and Attitudes About the Environment

Researchers in the mid to late 20th century examined the impact of environmental knowledge and attitudes on promoting environmentally-friendly behavior (DeYoung, 1986; Hines, Hungerford, & Tomera, 1986–87). After being educated about the problems and possible solutions surrounding environmental issues, researchers predicted that

people would begin to modify their behaviors to benefit the environment. Some researchers have shown that environmental knowledge can have a positive effect on environmentally-friendly attitudes, which can then translate into a positive impact on environmentally-friendly behaviors (Borick & Rabe, 2010; Kollmuss & Ageyman, 2002). For example, Borick & Rabe (2010) conducted national and state level surveys to analyze which factors shape beliefs and attitudes about climate change and found that a combination of personal observations, meteorological events, and physical changes in the planet all influenced people's attitudes and beliefs about climate change, with partisan leaning playing a significant role.

While the influence of political ideology on environmentally-friendly attitudes and beliefs is clear, the relationship between political ideology and environmentally-friendly behavior is less certain. Researchers have found some evidence that people who hold environmentally-friendly attitudes are more likely to practice environmentally-friendly behaviors but this relationship is often modest at best (Blake; 1999; Scott & Willits, 1994). Knowing that attitudes are shaped by knowledge can be useful information in gaining support for climate change policies, but critics argue that it does little to predict environmentally-friendly behaviors (Kaiser et al., 1999; Lubell, Zahran, & Vedlitz, 2007).

Researchers refer to this gap between environmentally-friendly attitudes and environmentally-friendly behavior as the Value-Action Gap (Blake, 1999) or the Attitude-Behavior Gap (Darnton, 2006; Kollmuss & Agyeman, 2002). On one hand, it might make sense to hypothesize that people who have knowledge about environmental

problems and express environmentally-friendly attitudes would practice environmentally-friendly behaviors. Kollmuss & Agyeman (2000) argue that it does not make sense to assume environmental knowledge or attitudes will increase the likelihood one will practice environmentally-friendly behaviors after one considers how difficult it really is to change existing habits. One reason why attitudes may not lead to changes in behavior is that there is often a weak link between attitudes and behaviors. Behaviors such as driving or flying are not always closely linked to attitudes such as being concerned about air quality, land conservation or climate change (Darnton, 2006; Kollmuss & Agyeman, 2000; Quimby & Angelique, 2011).

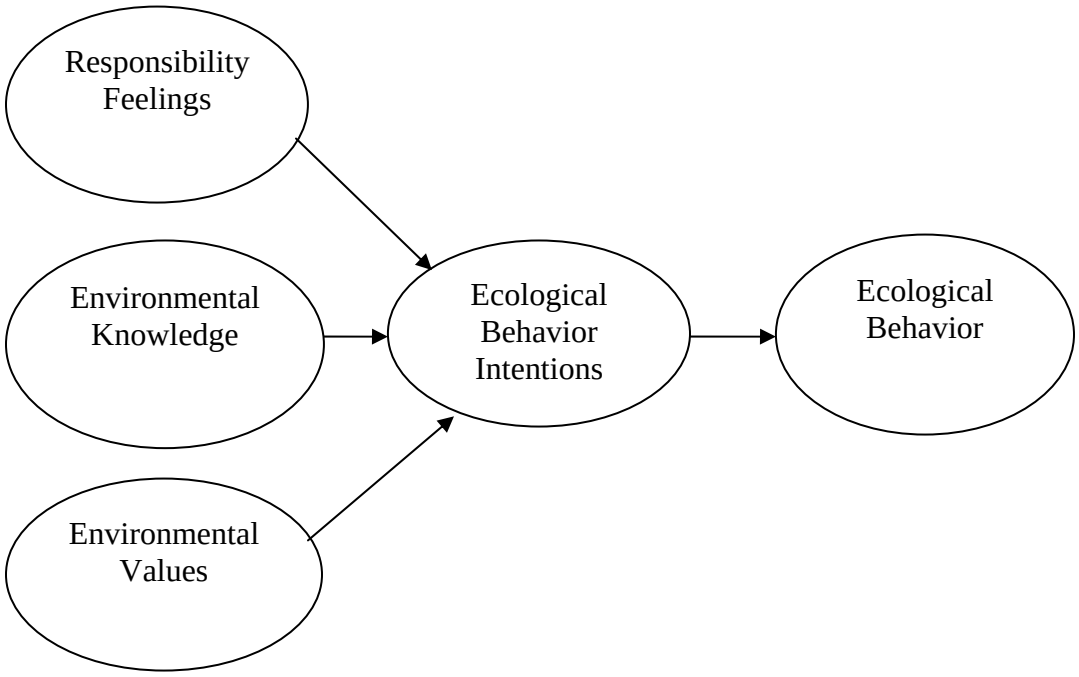
Altruism

A variety of studies have been conducted to assess the impact of people's morals, values and feelings of altruism on environmentally-friendly behaviors (e.g. Corbett, 2005; De Young, 1985; Hopper & McCarl Nielsen, 1991; Kaiser et al., 1999; Lubell et al., 2007). According to Schwartz's norm-activation (or altruism) theory, behavior is informed by social norms and personal norms that can be activated by ascription to responsibility and awareness of consequences of the given situation or issue. From this perspective, people will practice environmentally-friendly behaviors when norms are activated by feelings of responsibility related to environmental problems and/or awareness of consequences of the environmental problems (Hopper & McCarl Nielsen, 1991). This involves thinking about other people and the larger social consequences of one's actions as opposed to only considering one's individual concerns or comfort.

An early example of research relating environmentally-friendly behaviors to altruism can be found in De Young's (1985-86) survey data, which shows that people are intrinsically motivated to recycle and reuse materials. De Young argues that the extrinsic motivators such as being paid to recycle had little impact on motivating people to recycle, while intrinsic factors such as finding personal satisfaction in recycling proved to be strongly correlated with behavior. Researchers seeking to explain environmentally-friendly behavior, according to De Young (1985-86), should focus on investigating the personal satisfactions that result from practicing recycling or conservation activities and helping people experience those satisfactions.

Kaiser et al. (1999) also argue that ecological or environmentally-friendly behavior is at least partially in the moral realm. After analyzing survey data from two different studies conducted on the same topic, the researchers explained that rational choice models were not sufficient in predicting environmentally-friendly behavior largely because they exclude variables related to social norms. Feelings of responsibility, environmental knowledge, and values all influence ecological behavior intention which influences environmentally-friendly behavior as shown in Figure 1 below (Kaiser et al., 1999).

Figure 1 – Ecological Behavior as a Function of Environmental Attitude Extended by Responsibility Feelings (Recreated from Kaiser et al., 1999)



Demographic Characteristics

Researchers have examined the influence of many demographic variables and have found political ideology, gender, age, income, and education level to be good predictors of environmentally-friendly behaviors (Corbett, 2005; Kaiser et al., 1999; Scott & Willits, 1994). Below I discuss what researchers have found regarding the influence of these variables on practicing environmentally-friendly behavior.

Political Ideology

Researchers have found that people of liberal and moderate political ideology are more likely to support of environmentally-friendly policies such as increased taxes on oil and gas, or regulations to control pollution, than their conservative counterparts are

(Klineberg et al., 1998). Supporting environmentally-friendly policies, however, is not the same as being more likely to practice environmentally-friendly behaviors. Klineberg et al. (1998) argue that the positive correlation between being liberal and supporting environmentally-friendly policies may be in part due to the way in which questions about environmental concern and behavior are presented. Survey questions often ask respondents to make tradeoffs between economic growth and environmental regulation. People who fall on the conservative side of the political spectrum tend to want less government regulation in general so it may be misleading to assume they do not have concern for environmental issues or are unwilling to practice environmentally-friendly behaviors. It may be that they just do not want environmental regulation at the expense of business interests and the economy.

Theodori & Luloff (2002) found that liberals were more likely than conservatives were to maintain pro-active positions on the environment. They also found a positive relationship between maintaining proactive positions on the environment and engaging in environmentally-friendly behaviors. Scott & Willits (1994) found that people who were politically liberal were more likely to practice consumer related environmentally-friendly behaviors, but not necessarily more likely to participate in political environmentally-friendly behaviors such as attending meetings at an environmental organization or joining clean-up drives. Since there is some inconsistency in the findings that liberals are more likely to practice environmentally-friendly behaviors I use regression analysis to test this relationship in this thesis.

Gender

Kollmuss & Ageyman (2002) argue that gender is a significant predictor of environmentally-friendly behaviors and attitudes with women generally being more likely than men are to engage in environmentally-friendly behaviors. Other researchers, however, have found mixed results when measuring the effect of gender on environmentally-friendly behaviors. Klineberg et al. (1998) found that women were more prepared than men are to pay the regulatory costs of environmental protection, but not the economic costs of environmental protection. They also found that women were more likely to report participating in "green" shopping, while men were more likely to recycle or contribute to environmental organizations. Adding to the complexity of this relationship, Theodori & Luloff (2002) found that men were more likely than women were to stop buying a product because it caused environmental problems and women were more likely than men were to attend a public meeting or hearing about the environment.

Age

Studies have generally concluded that younger individuals are more likely to engage in environmentally-friendly behaviors (Kollmuss & Ageyman, 2002; Klineberg et al, 1998; Theodori & Luloff, 2002). Klineberg et al. (1998) found that the younger someone is the more likely he or she is to avoid environmentally damaging products. As Scott & Willits (1994) point out, however, that these results can be misleading since their results showed that older people were more likely to engage in politically oriented environmentally-friendly behaviors such as joining a clean-up drive or attending a

meeting related to ecology but younger people were more likely to engage in consumer related environmentally-friendly behaviors.

Income

People with higher levels of income are usually more likely to express concern for environmental issues and practice environmentally-friendly behaviors (Klineberg et al., 1998; Scott & Willits, 1994; Theodori & Luloff, 2002). Scott & Willits found that people with higher levels of income were indeed more likely to engage in both consumer and political environmental behaviors, but the associations were weak making it difficult to draw any strong conclusions about the relationship. In contrast, Borek & Bohon (2008) found that people with a family income at or above the national average were actually 13 percent less likely to reduce driving for environmental reasons. This is one example in which the specific behavior being examined by the researcher can greatly affect the results of the research. Scott & Willits (1994) examined consumer behaviors such as purchasing a product for environmental reasons and buying products made of recyclable material; these activities are likely easier to accomplish than trying to take transit instead of drive a car.

Education Level

Level of education is another variable that researchers show is positively correlated to environmentally-friendly behavior (Klineberg, 1998; Scott & Willits, 1994; Theodori & Luloff, 2002). Klineberg et al. (1998) argue that environmental supporters tend to be younger, better educated and politically moderate or liberal, but note that these results are occasionally contradicted by other studies. Scotts & Willits (1994) found

education to be the strongest predictor of environmental behaviors with higher levels of education being positively correlated to both consumer and political environmentally-friendly behaviors such as switching products for environmental reasons, joining clean-up drives, and writing congressional representatives concerning pollution problems.

Influences of Economic and Environmental Policy on Individual Behavior

While much of the research about predicting environmentally-friendly behaviors focuses on individual demographic characteristics, many researchers at least note the influence of the economic and environmental policies in promoting environmentally-friendly behaviors. Below I discuss what researchers have found regarding the influence of economic and environmental policies in predicting environmentally-friendly behaviors.

Economics

Many researchers have examined the impact of the economy and financial calculations on people's likelihood to practice environmentally-friendly behaviors, and most have found that economics are usually not the deciding factor in people's decisions to carry out an environmentally-friendly behavior (Crompton, 2008; De Young, 1986; Gershon, 2009; Hopper & Nielsen, 1991; Kaiser et al., 1999). These researchers do not argue that people do not consider gas prices when deciding to take the bus or drive to work. Instead, they argue that this decision has more to do with whether or not it is possible, convenient, and/or important for that person to take the bus, and the savings from not buying gas are an added benefit (Gershon, 2009). Researchers are increasingly seeing environmentally-friendly behaviors as pro-social and altruistic behaviors

stretching into the moral realm where the drivers of behavior are not extrinsic but intrinsic (De Young, 1986; Kaiser et al., 1999).

Environmental Policies

When environmentally-friendly policies and laws do not exist, it allows other forces such as free-market economies to shape people's actions (Borek & Bohon, 2008). In some cases that might encourage environmentally-friendly behaviors, while in other cases it might discourage environmentally-friendly behaviors. For example, consuming less energy can save on electricity costs creating a win-win situation in which people save money and less pollution is released into the air. However, a behavior such as purchasing a product made from recycled materials might cost more than its non-recyclable based substitute creating a situation in which people have to spend extra money in order to practice an environmentally-friendly behavior.

To measure the effect of national-level environmentally-friendly policies on engaging in environmentally-friendly behaviors Borek & Bohon (2008) used a variety of factors including environmentally-friendly policies (stringency and consistency of environmental regulations, the percentage of land under protected status), cooperative participation in environmentally-friendly activities (number of memberships in environmental intergovernmental organizations) and subsidies offered for energy and materials. In their research, Borek & Bohon (2008) found that a one-point increase in the policy score of a county resulted in a 20 percent increase in the likelihood a resident would drive less. The authors admit that they are not able to draw conclusions about the

causal relationships between reduced car driving and these policy scores but this is still interesting information to consider and may be worth further investigation.

Few studies have examined the impact of national environmental policies and practices on environmentally-friendly behavior with the exception of land use studies (Borek & Bohon, 2008). Land use research has shown that the way in which a community is built can make a significant difference in the transportation choices people who live in those communities make (Borek & Bohon, 2008). Further research focused on examining examine the ways in which individual, organizational, and societal factors interconnect and influence one another is needed.

Conclusion

Given the depth and breadth of information available on environmentally-friendly behavior it is clear that no conclusions will be reached in the immediate future regarding the most significant variable in predicting or encouraging environmentally-friendly behavior. Stern (2000) argues that there may not be a need for an overarching environmentally-friendly behavior model asserting that researchers need empirical analysis to understand any specific environmentally-friendly behavior because “the role of environmentalist predispositions can vary greatly with the behavior, the actor, and the context.” Increasingly researchers are arguing that different behaviors have different barriers to action that need to be addressed and therefore require unique models or programs designed to change those specific behaviors (Barr et al., 2010; Darnton et al., 2006; McKenzie-Mohr, 2000; Stern, 2000). For example, encouraging people to recycle may prove to have different and fewer barriers to action than encouraging people to drive

less especially in areas where curbside recycling is an established program. The barriers to driving less can include time, convenience, and weather, while the barriers to recycling might only be remembering to put materials in a separate can.

While it may be true that each behavior should to be examined closely in order to determine the best way to encourage it, I also argue that there is value in identifying the best combination of variables to predict environmentally-friendly behavior. Understanding why people practice environmentally-friendly behaviors can help public officials, non-profit professionals and business leaders understand how to encourage these behaviors by focusing efforts on reinforcing the motives that already exist. In the following chapter, I outline the variables I use to examine the relationship between ideology and people's willingness to change some of the things they do to help improve the environment.

CHAPTER 3
METHODOLOGY

In this chapter, I discuss the theoretical model and data I use to examine the relationship between political ideology and willingness to change behavior to improve the environment. Below I outline the functional form of the equation and follow with a description of the variables including how I have coded them. I conclude with a summary of the data and a brief discussion regarding the descriptive statistics of the variables.

Dependent Variable and Theoretical Model

Regression analysis allows researchers to measure the effect specific variables have on a dependent variable while controlling for a variety of independent variables that also influence the dependent variable (Studenmund, 2011). For example, researchers use regression analysis to try to explain housing prices as a function of a series of independent variables such as size, age, neighborhood, and other characteristics. A researcher could ask what effect a one-square-foot increase in the size of a house would have on the price of the home while holding all other variables constant.

I examine the amount of influence political ideology has on people's willingness to change their behavior to improve the environment. Regression analysis is an appropriate method for this question because it allows the researcher to examine the relationship between two variables while controlling for a variety of other variables. Since many variables influence willingness to change behavior to improve the environment, regression analysis will help identify which variables are the best predictors of willingness to change behavior. Consistent with the literature in the previous chapter,

the model outlined below includes a variety of variables that researchers have found to have a significant relationship with people practicing environmentally-friendly behavior.

Dependent Variable

The data used for this thesis is from a regular monthly poll series conducted by ABC News, Washington Post, and Stanford University in April 2007 that focused on global warming and other environmental issues. The dependent variable is a question from this survey that asks Respondents how willing they are personally to change some of the things they do in order to improve the environment. Respondents are able to select one of four answers: 1) very willing, 2) somewhat willing, 3) not so willing, and 4) not willing at all. I have recoded this variable with one being equal to "not willing at all" and four being equal to "very willing." Respondents could also give the answer of "depends" but since only 12 out of 997 respondents gave this answer, I dropped those entries in order to get a better measure of the dependent variable.

Theoretical Model

In this theoretical model, I include measures for all the variables that I discussed in the previous chapter as well as variables for race, being a parent and being a homeowner. Klineberg et al. (1998) included race as a variable but none of the researchers included variables for being a parent or being a homeowner. All of these variables are included to ensure that I have a variety of control variables and to decrease the possibility of committing omitted variable bias. From a theoretical perspective, these variables could influence willingness to change behavior to improve the environment,

therefore, it is better to include them and find out what the relationship is than to exclude them and risk omitting variables from the equation (Studenmund, 2011).

Functional Form

Regression equations can take a series of different forms depending upon the data and the theory behind the question at hand. Choosing the functional form that best explains the relationship between the independent and dependent variables is important as it can influence the regression results (Studenmund, 2011). The standard regression functional form is a linear equation known as the Ordinary Least Squares (OLS) and this is the form that should be used unless theory indicates that another form is more appropriate. In an OLS functional form the coefficients are left in their original linear form and will produce a straight line when data points are graphed. If the equation of interest consisted of home price as a function of house age a standard linear form may not theoretically make sense. While housing prices do tend to appreciate over the life of the home, the relationship might take more of a curved shape since housing prices fluctuate with the economy and very old homes that are not well-maintained may begin to lose value some one point. Therefore, it would be appropriate to consider using a double-log (taking the natural log of both dependent and independent variables) or quadratic (an equation using squared terms) functional form. Only in rare circumstances should a functional form be selected based solely on which form fits the data best (Studenmund, 2011).

In this thesis, I use a log-linear functional form (also known as left-side semilog functional form) because it will allow me to easily interpret what the effect of political

ideology is on environmentally-friendly behavior in percentage terms. This form is particularly useful to political scientists and other researchers wanting to quickly analyze regression results because a one-unit change in the independent variable will result in a change in percentage terms on the dependent variable. In a log-linear functional form the natural log of the dependent variable is used but all variables on the right-hand side of the equation (the independent variables) are left in their original linear form.

The chart below lists the variable, provides a brief description of what the variables are measuring and the predicted direction of the relationship I expect each variable to have to the dependent variable.

Table 1 – Variable Descriptions and Expected Signs

Independent Variable	Measurement	Expected Sign
Log of Willingness to Change Behavior to Help Improve the Environment	Values 1-4 where 1=not willing at all, 2=not so willing, 3=somewhat willing, 4=very willing to change some of the things Respondents do to improve the environment	
Dependent Variables		
Liberal	Dummy variable where 1=liberal and 0=not liberal	+
Moderate	Dummy variable where 1=moderate and 0=not moderate	+
Income	Values 1-6 representing consecutive income blocks	+
College Graduate	Dummy variable where 1=Bachelor's Degree or higher and 0=no Bachelor's Degree	+
Home Owner	Dummy variable where 1=homeowner and 0=not a homeowner	+
Kids under 18 living at Home	Dummy variable where 1=kids under 18 living at home 0=no kids under 18 living at home	+

Table 1 (continued)

Independent Variable	Measurement	Expected Sign
Self-Rating of Global Warming Knowledge	1-4 self-rating of how much respondents know about global warming where 1=nothing, 2=a little, 3=a moderate amount, 4=a lot	+
Rating for How Much Can be Done to Reduce Future Global Warming	1-5 rating where 1=nothing, 2=hardly anything, 3=just some, 4=a good amount, 5=a great deal	+
Rating of the Condition of Environment	1-5 rating of the condition of the environment where 1=very poor, 2=poor, 3=fair, 4=good, 5=excellent	-
Female	Dummy variable where 1=female and 0=male	+
Age	Values 18-98 representing the age of the Respondent	-
Black	Dummy variable where 1=Black and 0=not Black	+/-
Hispanic	Dummy variable where 1=Hispanic and 0=not Hispanic	+/-
Asian	Dummy variable where 1=Asian and 0=not Asian	+/-
Other (race)	Dummy variable where 1=other race and 0=not other race	+/-
Recycling Law In Area	Dummy variable where 1=a recycling law exists in area and 0=recycling law does not exist in area	+
Rating of How Much Fed Government Should do to Deal with Global Warming	1-5 rating of how much government should do to address global warming where 1=much less, 2=somewhat less, 3=doing about the right amount, 4=somewhat more, 5=much more	+
Favors Gas Tax as Strategy to Reduce Future Global Warming	Dummy variable where 1=Respondent favors a gas tax a way to address global warming and 0=Respondent does not favor a gas tax	+
Favors Electricity Tax as Strategy to Reduce Future Global Warming	Dummy variable where 1=Respondent favors a tax on electricity as a way to address global warming and 0=Respondent does not favor electricity tax	+

Key Explanatory and Independent Variables

Based on the research outlined in the literature review I have included the independent variables listed above to serve as controls in order to gain a more accurate measure of the effect of the key explanatory variable, political ideology, on an individual's willingness to change behavior to improve the environment.

Political Ideology

I am mostly interested in the effect that political ideology has on how respondents answer the question on how willing they are to change some of the things they do to improve the environment, while controlling for variables including age, knowledge about global warming, income, education, and environmental laws. My hypothesis is that the more liberal a person is on the ideological spectrum the more willing they will be to change some of the things they do to improve the environment and that this will be a statistically significant relationship. To measure political ideology I created dummy variables for liberal, moderate and conservative. When I run the regression, I will leave the dummy variable for conservative out of the equation and examine the effect that being liberal has on how respondents answer the willingness to change behavior question compared to being conservative.

Income

As a measure of economic status, I have included income in the regression analysis. I am uncertain what the direction of the relationship between income and the dependent variable will be since studies have found that people with higher income tend to express more concern for environmental issues but that they do not always practice

more environmentally-friendly behaviors (i.e., people who earn more tend to drive more miles). The variable in the data set is grouped into income brackets: 1) under 20 thousand dollars, 2) 20 to under 35 thousand dollars, 3) 35 to under 50 thousand dollars, 4) 50 to under 75 thousand dollars, 5) 75 to under 100 thousand dollars, and 6) above 100 thousand dollars. I left this variable as a 1-6 continuous variable since it will still give me some measure of what the impact of lower or higher income levels have on the dependent variable. The lower income brackets were lower numbers on the 1-6 scale so it was not necessary to recode this variable.

Education Level

One's knowledge on a topic may describe them as an individual but obtaining a degree often influences the social circles in which one chooses to spend her time. Having a degree leads to higher paying jobs which can result in different social experiences and likely different decisions related to environmentally-friendly behaviors. The data set includes a question that offered respondents six education categories: 1) 8th grade or less, 2) some high school, 3) graduated high school, 4) some college, 5) graduated college. I created a dummy variable for being a college graduate by recoding five equal to one and one through four equal to zero. The responses "don't know" and "missing" were dropped.

Parents and Home Owners

While the literature did not mention being parents or homeowners as having an impact on the likeliness that one will practice environmentally-friendly behaviors I include these variables because it seems like they could potentially have some influence on behavior. From a theoretical perspective, it seems that parents would be more likely to

practice environmentally-friendly behaviors since they would potentially be more concerned about the state of the environment for their children's sake. Similar to being a college graduate, being a parent as well as a homeowner could influence the types of social circles in which people find themselves. I am unsure as to whether either of these variables will have a significant relationship with willingness to change behavior.

To create a dummy variable for being a parent I coded a question that asked Respondents whether they had children under 18 living at home as "yes" equal to one and "no" equal to zero. The survey also asked Respondents if they own or rent their home and I left one equal to own home and recoded rent equal to zero to create a dummy variable for homeowner. Responses coded for "don't know" and "missing" were dropped from the data set.

Knowledge & Attitudes

To measure an individual's knowledge about environmental issues, I include data from a question that asks respondents how much they feel they know about global warming: 1) a lot, 2) a moderate amount, 3) a little, or 4) nothing. I flipped this scale around so that four is equal to "a lot" and one is equal to "nothing", in order to reduce confusion in analyzing data. I expect that this variable will have a positive relationship with how willing people are to change some of the things they do to improve the environment, however, I am not sure that this relationship will statistically significant since researchers have found inconsistent results when examining the relationship between environmental knowledge and behavior (Borick & Rabe, 2010; Kollmuss & Ageyman, 2002).

To measure attitudes about environmental issues I created a dummy variable with one signifying that the respondent believes that something can be done to address global warming and zero signifying that the respondent doesn't believe that anything can be done to address global warming. I anticipate that this variable will be significantly and positively related to willingness to change behavior. If people think that something can be done to address global warming it seems like they would be more willing to change some of the things they do for environmental reasons.

Another variable I use to measure attitudes about the environment is 1-5 rating of the condition of the natural environment: 1) excellent, 2) good, 3) fair, 4) poor, and 5) very poor. I recoded this variable so that one is equal to "very poor" and five is equal to "excellent" since it was coded in the opposite direction like the other scaled variables in this data set. I expect to find that this attitude variable has a negative relationship to the dependent variable in that people who give the natural environment a lower rating will be more likely to say that they are willing to change some of the things they do to improve the environment. It seems reasonable that people who think the natural environment is in excellent condition may think that there is no need to change some of the things they do to improve the environment.

Gender

As mentioned in the previous chapter, researchers have found that being female can have a positive relationship to practicing environmentally-friendly behaviors. To measure gender I have created a dummy variable for which being female is equal to 1 and being male is equal to zero. Given the conflicting results that Scott & Willits (1994)

found concerning females (that they are somewhat more likely to engage in consumer-oriented environmentally-friendly behaviors while males were more likely to engage in politically-oriented environmentally-friendly behaviors) I am uncertain whether being female will negatively or positively impact one's willingness to change behavior to improve the environment.

Age

Consistent with other studies, I have included age as one of the independent variables that may have a significant effect on predicting how willing one might be to change behavior to improve the environment. I expect to find an inverse relationship between age and willingness to change behavior to help improve the environment since other studies have shown that younger people tend to be more likely to practice environmentally-friendly behaviors (Klineberg et al., 1998; Theodori & Luloff, 2002). I left this variable as a continuous integer as it was not necessary to recode it.

Race

While other studies have not made note of a significant relationship between race and environmentally-friendly behaviors, I include it to avoid omitted variable bias. According to Studenmund (2001) it is a violation of classical principles to omit variables that could potentially influence the dependent variable. Using STATA's tab command I created five race dummy variables for White, Black, Asian, Hispanic and Other. In the analysis I will leave the dummy for White out of the regression in order to measure the other dummy variables against it. The data will show the impact that being Asian or Black has on people's willingness to change their behaviors relative to being White.

Recycling Law Required in Community

The survey includes a question that asks respondents whether recycling is required by law in the area. It will be interesting to see how much the existence of a recycling law affects willingness to change behavior to improve the environment. This variable was already coded with one equal to "yes", but I recoded "no" to be equal to zero instead of two. I dropped the "missing" and "don't know" answers from the data set.

Support for Environmental Policy

The final three variables are attitudes or opinions about supporting environmental policy: a 1-5 rating of how much federal government should do about global warming, favoring an increase in gas tax, and favoring an increase in electricity tax (with the taxes being a strategy to reduce the impacts of global warming). The first variable regarding how much the federal government should do to address global warming had to be recoded like the other scale variables in the data set and is now coded as follows: 1) much less, 2) somewhat less, 3) doing about the right amount, 4) somewhat more, and 5) much more. I expect to find that the more people think government should do about global warming the more willing they will be to do to improve the environment. However, if they think government should do much more to address environmental issues people might assume that they do not need to do anything on their own, making this a negatively correlated relationship.

The dummy variables for favoring increased gas and electricity taxes as a way to address global warming were both coded as one equal to favoring the tax and zero equal to not favoring the tax. I predict that the relationship will be significantly and positively

related to the dependent variable in that if people are in favor of a gas or electricity tax they will be more willing to change their behavior to improve the environment.

Data

The data used in this thesis is from the ABC News/Stanford University/Washington Post Survey on Global Warming conducted in April of 2007. The survey of 1,002 United States residents was conducted via phone interviews through random-digit dialing. To select respondents within households the interviewer asked for the adult living in the household who last had a birthday and was home at the time of the call. I obtained the data by downloading it from the Interuniversity Consortium for Political and Social Research (ICPSR) website. As discussed earlier, many of the variables were coded into dummy variables and scales were reversed in order to prepare the data for analysis. All entries coded as “missing” or “don’t know” were dropped from the sample since it was usually only 2 or 3 percent of the entries and still left over 700 responses for each question included in the model. The descriptive statistics are listed below.

Table 2 – Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
Dependent Variable					
Willingness to Change Behavior to Improve the Environment	985	3.439594	0.644438	1	4
Dependent Variables					
Knowledge About Global Warming	999	2.751752	0.71376	1	4
How Much Can be Done to Reduce Future Global Warming	984	3.694106	1.05636	1	5
Rating of the Condition of the Environment	997	2.808425	0.943381	1	5
Female	1002	0.549900	0.497752	0	1
Age	973	51.037	15.87848	18	98
White	972	0.809670	0.392762	0	1
Black	972	0.076131	0.265345	0	1
Hispanic	972	0.056584	0.231165	0	1
Asian	972	0.009259	0.095827	0	1
Other (race)	972	0.048353	0.214623	0	1
Liberal	945	0.215873	0.411644	0	1
Moderate	945	0.442328	0.496925	0	1
Conservative	945	0.341798	0.474563	0	1
Income	872	3.821101	1.667578	1	6
College Grad	987	0.377912	0.485111	0	1
Home Owner	975	0.829743	0.376050	0	1
Kids at Home	985	0.332994	0.471524	0	1
Recycling Law in the Area	964	0.224066	0.417182	0	1
How Much Government Should do to Deal with Global Warming	971	4.05664	1.146885	1	5
Favors Gas Tax	986	0.318458	0.466114	0	1
Favors Electricity Tax	988	0.193319	0.395101	0	1

One interesting, but perhaps not entirely surprising number in the descriptive statistics is that on average people claim to be between “somewhat willing” and “very willing” to change some of the things they do to improve the environment. However, as I will discuss in the following chapters, this does not necessarily mean that people will necessarily follow through on changing behaviors, given that many researchers have shown that a gap known as the Value-Action Gap or Attitude-Behavior Gap exists (Darton et al., 2006; Klineberg, et al, 1998; Kollmuss & Agyeman; Scott & Willits, 1994)

We can also see that the average age of the respondents is 51 years old and a few more than half are female. Approximately 38 percent of the respondents have a Bachelor’s degree or higher and nearly 83 percent of them are homeowners. These numbers are slightly higher than national Census numbers as approximately 30 percent of the population has a Bachelor’s degree or higher and only about 68 percent of people owned homes in 2007. The statistics above show that 22 percent of respondents are liberal, 42 percent are moderate and 34 percent are conservative. According to a series of 2010 Gallup and USA Today/Gallup polls (Saad, 2012), 22 percent of the population was liberal, 37 percent was moderate and 37 percent was republican in the year 2007 (the same year this survey took place). The data set includes a weight, which I use in the regression equation to correct these discrepancies and align them with U.S. Census numbers. Another interesting observation from the descriptive statistics is that on average people think that government should be doing more to address global warming but few of them favor taxes on gas or electricity as policies to address the issue. In the following chapter, using the data and functional form outlined above, I will run the log-lin

regression, report the initial findings, and discuss potential issues to consider when conducting a regression analysis.

CHAPTER 4
RESULTS

To address the question of whether or not political ideology affects people's willingness to change behavior to improve the environment, I use a log-linear functional form of the regression model as outlined in the previous chapter. In this chapter, I discuss how I tested for issues with heteroskedasticity and multicollinearity. In the second part of the chapter, I report the regression coefficients at the 99% confidence level and discuss the initial implications of the regression results.

Heteroskedasticity

Heteroskedasticity occurs when there is variance in the error term across the observations, which can lead to misestimates of variables and make hypothesis testing unreliable. To test for heteroskedasticity I use the Breusch-Pagan/Cook-Weisberg Test that tests the null hypothesis that homoskedasticity exists. The report gives a chi-square value that should be a small number when homoskedasticity is present. The results the Breusch-Pagan/Cook-Weisberg test show that heteroskedasticity is a problem in this model since the chi-square value is above 20 making it a high number for this test. Therefore, I report the regression with a correction for robust standard errors as recommended by Studenmund (2011). I report the Breusch-Pagan/Cook-Weisberg test and regression with robust standard errors in the following section.

Multicollinearity

Another potential issue that can arise when using regression analysis is multicollinearity, which occurs when two variables run closely together sharing a linear relationship. When multicollinearity exists between variables it becomes difficult for

researchers to distinguish the separate effects of multicollinear variables and will even cause the statistical software program to omit variables if they run too closely together. Multicollinearity does not create bias in the coefficient estimates but it will cause standard errors and variances of the estimates to increase which can in turn increase the chances of getting an unexpected sign for a coefficient (Studenmund, 2011). To test for multicollinearity I examine simple correlation coefficients. Any simple correlation coefficient that has an absolute value of 0.80 or more may be an indication of severe multicollinearity. I removed the dummy and categorical variables before running the correlation coefficients. According to this test, correlation coefficients in this data do not show any signs of severe multicollinearity as all of the values are much lower than 0.80. The simple correlation coefficients are listed in Table 3 below.

Table 3 – Simple Correlation Coefficients

	Willingness to Change Behavior to Improve the Environment	Income Level of Respondent	Self-Rating of Knowledge about Global Warming	How Much Can be Done to Reduce Future Global Warming	Rating of the Condition of the Environment	How Much Government Should do to Deal with Global
Willingness to Change Behavior to Improve the Environment	1					
Income	0.0252	1				
Knowledge about Global Warming	0.1044	0.1849	1			
How Much Can be Done to Reduce Future Global Warming	0.3083	-0.0833	0.0503	1		
Rating of the Condition of the Environment	-0.2279	0.1245	-0.0559	-0.342	1	
How Much Government Should do to Deal with Global Warming	0.2793	-0.0337	0.0653	0.593	-0.4464	1

Another, more rigorous, test for multicollinearity requires examining the variance inflation factors (VIFs) which is an index that shows how much multicollinearity has increased the variance of a estimated coefficient (Studenmund, 2011). According to Studenmund (2011), VIFs with a value greater than 5 may indicate a problem of multicollinearity. As indicated in the table below, the variables in this thesis do not have VIF scores higher than 1.88, which is further evidence that multicollinearity is not likely a problem in this regression.

Table 4 – Variance Inflation Factors

Variables	VIF
Liberal	1.63
Moderate	1.48
Income	1.52
College Grad	1.29
Home Owner	1.29
Kids at Home	1.4
Knowledge About Global Warming	1.11
How Much Can be Done to Reduce Future Global Warming	1.68
Rating of Condition of Environment	1.42
Female	1.1
Age	1.71
Black	1.06
Hispanic	1.05
Asian	1.03
Other Race Dummy	1.07
Recycling Law In Area	1.04
How Much Fed Govt. Should do to Deal with Global Warming	1.88
Favors Gas Tax	1.38
Favors Electricity Tax	1.25

Regression Results

The regression coefficients for all variables are included in Table 5 with robust standard errors, minimum values and maximum values. Four out of 20 variables were significant as measure by a p value between 0.00 – 0.1 at the 99% interval confidence level. According to these regression results, political ideology is not a significant

predictor of the people's willingness to change some of the things they do to improve the environment. To confirm these results I ran a second regression to test whether I controlled for the characteristics of being liberal, moderate, and conservative through other independent variables. In the second regression, I only included the dependent variable (willingness to change behavior) and the key independent variable (political ideology). When running the regression with just these variables I found that moderates were 5.8 percent more willing than conservatives were to change their behavior to improve the environment at a statistically significant level. Being liberal, however, was not a statistically significant predictor of willingness to change behavior.

After this finding, I added variables I thought might be capturing some of the same characteristics as moderate political ideology into the equation. After adding age, income, race, gender, education level, homeownership, recycling law in the area, rating of the condition of the environment, and knowledge about global warming to the equation, I found that being politically moderate remained a statistically significant predictor of willingness to change behavior with a p>t score of .054 at the 99 percent confidence interval. Being moderate was no longer significant after adding any combination of the variables for favoring gas and electricity taxes, how much the federal government should do to deal with global warming, or how much can be done to reduce future global warming.

These variables likely capture some of the same characteristics as being politically moderate since they are related to attitudes about government policies. However, being liberal is not a significant predictor of willingness to change behavior

even without adding any additional variables to the equation;, therefore, I can conclude with some certainty that political ideology is not a significant predictor of willingness to change behavior for the environment in this regression. Ultimately, I report the findings from the multiple regression with all variables included because from a theoretical perspective all the variables have some influence on willingness to change behavior to help improve the environment and therefore should be included. Each of these variables has some influence on willingness to change behavior to improve the environment and if I remove them from the equation, then the reliability of the regression results would suffer from omitted variable bias. As such, it is clear that political ideology does not have a statistically significant relationship to willingness to change behavior to improve the environment.

The variable that proved to be the best predictor of willingness to change behavior to help improve the environment was the rating of how much one thinks can be done to reduce future global warming. For every one-unit increase in the amount one thinks can be done to reduce future global warming she is 5 percent more willing to change some of the things she does to help improve the environment. In the following chapter, I will discuss these results in more detail.

Being Hispanic, having kids under 18 living at home and favoring a gas tax as a policy to reduce future warming, also proved to be good predictors of willingness to change behavior for the environment. I am somewhat surprised that being Hispanic as opposed to White is a significant predictor of willingness to change behavior to improve the environment. Being Hispanic was the second most significant predictor of willingness

to change behavior even though the four other race categories are not statistically significant, and the literature I reviewed for this thesis did not mention race or ethnicity as a significant indicator of environmentally-friendly behavior. Further research should be conducted in order to investigate this particular relationship.

In the next chapter, I will further discuss how my hypothesis turned out to be incorrect and that the most significant predictor of willingness to change behavior to help improve the environment turned out to be the 1-5 rating of how much people thing can be done to reduce future global warming. I will also offer some recommendations regarding strategies to use when encouraging environmentally-friendly behaviors, areas of future research, and the limitations of this study.

Table 5 – Regression Coefficients

			Number of obs =	751
			F(20, 730) =	6.49
Breusch-Pagan / Cook-WeisbergTest			Prob > F =	0.0000
chi2(1) =	151.6800		R-squared =	0.1514
Prob > chi2 =	0.0000		Root MSE =	.19723
Variables	Coefficients	Robust Stand. Errors	Maximum	Minimum
Liberal	-0.0347	0.0412	-0.1414	0.0718
Moderate	0.0145	0.0202	-0.0378	0.0668
Income	-0.0053	0.0112	-0.0343	0.0236
College Grad	0.0414	0.0323	-0.0420	0.1250
Home Owner	-0.0076	0.0265	-0.0762	0.0609
Kids at Home	0.0563*	0.0291	-0.0189	0.1316
Global Warming Knowledge	-0.0015	0.0229	-0.0606	0.0576
How Much Can be Done to Reduce Future Global Warming	0.0506***	0.0114	0.02102	0.0802
Rating of Condition of Environment	-0.0211	0.0138	-0.0569	0.0145
Female	0.0196	0.0268	-0.0498	0.0890
Age	0.0006	0.0010	-0.0020	0.0032
Black	-0.0241	0.0430	-0.1352	0.0868
Hispanic	0.0875**	0.0358	-0.0051	0.1802
Asian	-0.1369	0.1265	-0.4636	0.1898
Other (race)	0.0047	0.0356	-0.0871	0.0967
Recycling Law In Area Dummy	-0.0555	0.0422	-0.1645	0.0535
How Much Fed Govt. Should Do to Deal with Global Warming	0.0039	0.0098	-0.0214	0.0292
Favors Gas Tax	0.0371*	0.0224	-0.0206	0.0950
Favors Electricity Tax	0.0228	0.0238	-0.0386	0.0844
Constant	1.0205	0.0976	0.7684	1.2726
*p< 0.1 ** p<0.05 ***p<0.01				

CHAPTER 5
CONCLUSION

As elected officials, the public, business owners, non-profit leaders, and other stakeholders continue to discuss mitigation and adaptation measures to address problems related to air quality, water quality, climate change, and environmental resource management, it is increasingly important to understand what motivates people to practice environmentally-friendly behaviors. Americans waste up to 75 percent of the resources they consume because of lack of awareness and efficiency, so it is important to understand how we might be able to change individual behavior, not just organizational and corporate behavior (Gershon, 2009). To better understand the factors that influence people's willingness to change behavior to improve the environment (specifically, the influence of political ideology), I used nationally-representative survey data to complete a multiple regression analysis. My hypothesis was that liberals would be more willing than conservations to change some of the things they do to help improve the environment since previous research pointed to a positive relationship between being liberal and possessing pro-active positions on environmental policies and environmentally-friendly attitudes, which have been linked to environmentally-friendly behaviors (Klineberg et al., 1998; Theodori & Luloff, 2002).

Multiple regression analysis results showed, however, that political ideology was not a significant predictor of how willing people are to change some of the things they do to improve the environment after controlling for knowledge and attitudes about the environment, demographic characteristics, support for environmental policy, and recycling law required in the community. In this chapter, I discuss the significant

predictors of environmentally-friendly behavior, make recommendations to policy makers, public and non-profit managers, business owners and program coordinators regarding how to promote these behaviors, and review the limitations of this research.

Significant Predictors of Environmentally-Friendly Behavior

Multiple regression analysis shows political ideology is not a significant predictor of willingness to change behavior to help improve the environment. Instead, I found that the more people think something can be done to reduce future global warming, the more willing they are to change some of the things they do to help improve the environment, regardless of political ideology. For each one-unit point increase on the 1-5 scale rating of how much people think can be done to reduce future global warming (with 1 equaling "nothing" and 5 equaling "a great deal"), people are 5 percent more willing to change their behavior in order to help improve the environment. It seems that people generally just want to believe that their actions will make a difference if they are going to go to the trouble of changing their behavior.

Three additional variables proved to be significant predictors of willingness to change behavior after controlling for knowledge and attitudes about the environment, demographic characteristics, support for environmental policy, and recycling law required in community. The variables were: being Hispanic, having kids under the age of 18 living at home, and favoring a gas tax as a way to reduce future global warming. Hispanics were 8.7 percent more willing than Whites were to change some of things they do to improve the environment, all else held constant. It is not clear why being Hispanic as opposed to being White was a statistically significant predictor of willingness to

change behavior while the other race variables were not; therefore, I recommend further research to examine this relationship more closely. It is possible that Hispanics could be a future target audience for public organizations when promoting environmentally-friendly behaviors.

People who have kids under the age of 18 living at home are 5.6 percent more willing than those who do not have kids living at home to change some of the things they do to help improve the environment. This could be pointing to the importance of altruism in willingness to change behavior since parents are likely concerned about the welfare of their children and future generations that may have to deal with environmental issues. Given these results, policy makers, public managers and non-profit leaders should consider targeting parents when promoting environmentally-friendly behaviors.

Finally, people who favor a gas tax as a way for the federal government to try to reduce future global warming are 3.7 percent more willing to change behavior to help improve the environment than those who oppose a gas tax. Interestingly, favoring an electricity tax as a way for the federal government to try to reduce future global warming is not a significant predictor of willingness to change behavior. Perhaps this is because people understand how driving affects the environment but do not clearly understand how electricity use affects the environment. If both of these variables regarding tax policies had proven to be significant predictors of environmentally-friendly behavior it would be easier to argue that support for environmental policy is a good predictor of environmentally-friendly behavior. Given these mixed results I suggest further research

to better examine the relationship between support for environmental policy and encouraging environmentally-friendly behaviors.

Recommendations for Encouraging Environmentally-Friendly Behavior

Given the regression results outlined above, policy makers, business owners, non-profit and public managers should focus on showing people how their actions can and do make a difference in helping to improve the environment. Organizations that want to encourage people to practice environmentally-friendly behaviors such as conserve water and energy, recycle, drive less, or use fewer pesticides should be sure to explain the positive environmental impact that will result from those actions. For example, to encourage people to use less water, public officials may want to consider offering data that explains the impact that reducing water consumption has on water supply. For example, public officials could offer specific information about the impact that saving a gallon of water a week has on the water supply. Such a pitch to conserve water might look something like "If you join your neighbors in reducing your water consumption by 1 gallon every week, Sacramento would save over 73 million gallons of water in a year. This could be as easy as shaving one minute off your shower time each day." Through decades of research, David Gershon (2006 & 2009) has found that it is this type of information that will help people understand which actions to take and that their actions can and do have an impact on improving the environmental health of the planet.

We know that people are not always motivated to act purely based on the information that there is an environmental problem, since the variable for how much knowledge people have about global warming was not a significant predictor of

willingness to change behavior, rather people have to believe that something can be done to reduce global warming. As other researchers have shown, the Value-Action Gap (also known as the Attitude-Behavior Gap) is a significant factor limiting researchers' ability to predict environmentally-friendly behavior. This research supports the idea that simply offering people information about environmental problems and possible behavior changes is not enough.

To go beyond producing traditional educational materials and information that focus on what the problem is and what people should do about it, I recommend producing materials and information that also show people specifically how their actions make a difference. Since multiple regression analysis shows that the more someone thinks something can done to reduce future global warming the more willing they are to change some of the things they do to improve the environment, I can concluded that people are interested in seeing and understanding how their actions make a difference. David Gershon (2009) has found that what really helps people translate the knowledge they have about the environment into new behaviors comes in answering four important questions:

- Where do I start?
- Which are the important actions?
- How do I implement these actions?
- Does what I do actually make a difference?

To help answer the last question in the list, Gershon and his team created a survey and computer program that allowed participants of his "sustainable lifestyles program" to

enter a variety of information regarding their behaviors and then receive a report showing them how much energy, money, water, CO2 emissions, etcetera, they had saved. By offering this type of information to people, Gershon and his team were able to show participants exactly how their actions made a difference which the participants found "fascinating and relevant for deciding which actions they would take" (Gershon, 2009). Policy makers, public managers, and business leaders who are motivated to encourage environmentally-friendly behavior should consider this when designing their program or campaign.

Limitations of This Research

All research methods come with some limitations that should be considered when analyzing and interpreting data. One major issue with using survey data is that it can be difficult to draw causal inferences since respondents answer survey questions at a single point in time (Singleton & Straits, 2010). In an experiment, the researcher has the ability to make changes to an independent variable and watch for changes in the dependent variable. In survey research, the independent and dependent variables are reported at the same time and statistical analysis is used to find a relationship. Despite this issue, surveys are still an appropriate tool for examining environmentally-friendly behavior given appropriate statistical methods and careful interpretation. Additionally, it can be very expensive and time intensive to conduct experiments which makes using survey data a more feasible research method (Singleton & Straits, 2010).

Another limitation of using survey data is the potential for reactivity, which causes systematic biased responses (Singleton & Straits, 2010). The dependent variable is

susceptible to biased responses because survey participants may have given a response that they feel was socially acceptable as opposed to what they would actually do. For example, respondents may have stated that they were "somewhat willing" to change some of the things they do to improve the environment simply because they felt that it was a more socially acceptable response than options such as "not very willing" or "not willing at all" to change behavior. This survey aims to minimize this bias by phrasing questions in such a way to imply a socially acceptable response and allow respondents to answer as confidentially (or even anonymously) as possible.

Finally, the question used for the dependent variable is vague. The survey asks respondents how willing they are to change some of the things they do to improve the environment. The question does not ask about a specific behavior making it difficult to draw strong conclusions about what causes people to practice environmentally-friendly behaviors. Respondents likely imagined different behaviors when they considered whether they were willing to change some of the things they do to help improve the environment. One person might be very willing to recycle while she might not be willing at all to drive less. Many of the studies in the literature review examined a specific environmentally-friendly behavior such as recycling (Kleinberg et al, 1998), signing a petition for an environmental cause or purchasing environmentally-friendly products (Scott & Willits, 1994). Respondents might answer this question very differently depending on the behavior they were thinking about when considering the question.

Final Thoughts

While multiple regression analysis shows that political ideology is not a significant predictor of willingness to change behavior to help improve the environment, this analysis offers other insights into promoting environmentally-friendly behaviors and helps identify areas for future research. This data and analysis show that people who are Hispanic (as opposed to White), think something can be done to reduce future global warming, have children under 18 living at home, and support gas tax increases to reduce future global warming are people who are more willing to change their behavior to improve the environment. These are important factors for policy makers, elected officials, public managers and business owners to keep in mind when they are looking to encourage environmentally-friendly behavior change. They should continue to look for opportunities to show people how their individual actions can and do make a difference in tackling environmental problems.

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