Women and the Environment: Mediating and Moderating Effects of Gender and Demographic Characteristics of Environmental Concern

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DEDICATION

This dissertation is dedicated to my primary source of motivation during the writing process:

Owen Clarke Sanderson-Price

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ABSTRACT

In this study I examine the relationship between environmental attitudes and gender. First, I explore variations across previous studies to determine patterns regarding gender differences in levels of environmental concern. Second, I look at the mediating effects of gender and several socio-demographic characteristics (age, race, class, education, political orientation, residence, martial status, number of children, religious identification, and scientific knowledge) on a variety of measures of environmental concern to assess the extent to which gender operates through other variables as it predicts levels of environmental concern. Third, I look at the moderating effects of gender on the same list of socio-demographic characteristics to determine the extent to which gender intersects with other variables to shape environmental attitudes.

I conduct a systematic review of literature using 22 peer reviewed journal articles, which include 128 measures of environmental concern, published between 1995 and 2010. I also test for mediating and moderating effects of gender and various socio-demographic characteristics on 14 measures of environmental concern using data from two sources: the General Social Survey Environment II: 2000 questionnaire and the American National Election Study 2008 Times Series Pre-election Survey. To test for mediating and moderating effects I employee several methodological techniques including principal component analysis, model building, linear regression techniques, and non-parametric regression methods.

The results of this study show that, in general, women do express a greater concern for the environment than men. However, gender in conjunction with other

socio-demographic characteristics has the potential to produce different effects than when gender is considered alone. This study supports the idea that the intersectionality of gender and other socio-demographic characteristics is of great importance and should not be ignored.

Key Words: Environmental sociology, environmental concern, ecogender, environmental demography

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CHAPTER ONE

INTRODUCTION

The increase in human-made environmental problems has necessitated a growing effort and need to understand environmental concern[1] as a driving force behind individual, family, and community decisions about environmental policies and practices (Schahn and Holzer 1990). Why does a consumer decide to buy a plastic bottle of water instead of refilling a reusable bottle with tap water? Why do some farmers engage in sustainable agriculture yet others do not? Why are scientists in agreement about the problems associated with global warming while the general public is divided (Dunlap and McCright 2008)? Understanding the degree to which different groups of people are concerned about the environment helps to provide answers to these questions. Although concern for the environment does not automatically translate into pro-environmental behavior, scholars assume that people are less likely to engage in environmentally friendly behavior if they are not concerned about environmental problems (Dietz, Fitzgerald, and Shwom 2005).

Research on environmental concern has made an enormous contribution to environmental sociology. Environmental sociology focuses on the relationship between humans and the physical environment, focusing specifically on the impact humans have on the physical environment and vice versa (Dunlap and Catton 1979). Scholars studying environmental concern have worked to understand the variables that influence

[1] The use of the term *environmental concern* in this dissertation reflects the definition presented by Dunlap and Jones (2002): "…the degree to which people are aware of problems regarding the environment and support efforts to solve them and/ or indicate a willingness to contribute personally to their solution" (p.485).

public concern for protecting the environment. The degree to which the public is concerned about environmental problems, and the identification of socio-demographic characteristics affecting levels of concern have major political and policy implications (Jones and Dunlap 1992). For example, younger people tend to express greater concern for the environment than older people (Jones and Dunlap 1992; Van Liere and Dunlap 1980), yet young people are less likely to vote in government elections than older people (Piven and Cloward 2000). Understanding these divisions is likely to be increasingly important as awareness of environmental problems expands and becomes a more dominate issue in political campaigns.

Although the majority of people do express an overall concern for the environment, some express a greater concern than others. Age, education, gender, political liberalism, and geographical location (urban vs. rural) are all variables that have been found to effect levels of environmental concern to varying degrees (Jones and Dunlap 1992). Young people, women, and Democrats, for example, tend to express greater concern for the environment than older people, men, and Republicans respectively (Davidson and Freudenburg 1996; Dunlap and McCright 2008; Jones and Dunlap 1992). Because the direction of correlation between these socio-demographic variables and environmental concern have been well established over decades of research, the current trend in environmental concern literature has shifted away from exploring socio-demographic variables (e.g., gender, age, race, and education) toward exploration of psychosocial variables such as altruism and independence (while controlling for socio-demographic variables; Dietz, Fitzgerald, and Shwom 2005).

Perhaps, however, these socio-demographic variables have not been specified as well as they could be in relation to environmental concern. For example, socio-demographic variables collectively explain little of the statistical variance in the distribution of environmental concern. Furthermore, although researchers cite the relationships between socio-demographic variables and environmental concern as established findings, there are several contradictions in the literature. For instance, the majority of studies find a positive correlation between education and environmental concern; that is, those with higher levels of education tend to express greater concern for the environment than those with lower levels of education (Jones and Dunlap 1992; Van Liere and Dunlap 1980). Yet it has been argued that women express greater concern for the environment than men because they have less technical knowledge and understanding of environmental processes (i.e. less scientific education) than men, causing women to fear the unknown (Davidson and Freudenburg 1996; Finucane, Slovic, Mertz, Flynn, and Satterfield 2000; Hamilton, Colocousis, and Duncan 2010). Because socio-demographic variables are typically considered in isolation to one another, contradictions such as this are rarely identified or discussed. Thus, my study, while recognizing the importance of forging ahead with research focusing on psychosocial variables, re-examines socio-demographic variables to explore the gaps and contradictions in the literature and the nuances of gender[2] and socio-demographic variables as they relate to environmental concern.

[2] Although sex is a demographic variable, gender is a culturally and socially constructed category (although often treaded as a demographic one).

There has been much research looking at gender differences in environmental concern (Davidson and Freudenburg 1996; Stern, Dietz, and Kalof 1993). This foundational literature demonstrates that women appear to be slightly and consistently more concerned about the environment than are men. However, the strength of the difference varies across the literature with some researchers finding consistent differences between men's and women's environmental concern (Finucane, Slovic, Mertz, Flynn, and Satterfield 2000), other researchers reporting little to no differences between the environmental concern of men and women (Slimak and Dietz 2006), and still other researchers reporting mixed results (Hamilton 2008). Many environmental concern scholars attribute these differences to the methodology utilized and the type of environmental concern measured (i.e. differences in the wording of survey questions; Dunlap and Jones 2002; Klineberg, McKeever, and Rothenbach 1998). For example, Davidson and Freudenburg (1996) find that women consistently express greater concern for the environment than men when asked specific questions related to potential health and safety risks associated with environmental problems.

Although I do agree that the framing of environmental issues (i.e. question wording) affects results, I also think that looking into the intersection between gender and other socio-demographic variables can help explain varied findings regarding gender differences in levels of environmental concern. For example, as stated previously, younger people tend to express greater concern for the environment than older people and women tend to express greater concern for the environment than men (Davidson and Freudenburg 1996; Jones and Dunlap 1992; Van Liere and Dunlap 1980), but how do these relationships translate to the level of environmental concern of

a 65 year-old woman or a 23 year-old man? Perhaps the mediating and moderating effects of gender and other socio-demographic variables (e.g., age, race, education, and political orientation) on measures of environmental concern can help explain inconsistent findings across studies.

Furthermore, there has been little progress made since the work of Davidson and Freudenburg (1996) in explaining gender differences in levels of environmental concern. For example, Davidson and Freudenburg (1996) found inconclusive support for the hypothesis that women express more concern for the environment than men because they are not pressured by competing economic concerns. Yet researchers continue to argue that economic interests interfere with men's environmental concern (Kalof, Dietz, and Guagnano 2002). Simultaneously women's involvement in the economic sector has increased (Hernandez 2005; Mishel, Bernstein, and Shierholz 2008-2009) but their concern for the environment has not decreased (as found in this study). Environmental concern scholars consistently control for gender in their models and cite Davidson and Freudenburg (1996) when discussing results, but changes in gender roles since the mid-nineties and are rarely accounted for.

The work presented here provides a comprehensive explanation of how environmental concern is shaped by gender. The purpose of my research is twofold. First, by conducting a systematic review of studies looking at gender differences in environmental concern, I explore the variation across previous studies with regard to the conclusions and patterns about gender differences. Second, I look at the mediating and moderating effects of gender and several socio-demographic characteristics (age, race, class, education, political orientation, residence, marital status, number of children,

religious beliefs, and scientific knowledge) on a variety of measures of environmental concern from two data sources to better understand how socio-demographic variables mediate and moderate the effects of gender on environmental concern. My work primarily builds on the vast body of environmental concern research by fully examining the complexities of gender as a socio-demographic variable that predicts levels of environmental concern, however, literature outside of environmental concern including feminist and ecofeminist literature is drawn on to provide a theoretical foundation for this research.

Theoretical Foundation

My conceptualization of gender within environmental sociology is most closely aligned with an ecogender framework, which is rooted in ecofeminism yet inclusive of perspectives such as feminist political ecology and environmental justice. Ecogender studies views gender as a critical variable along with race and class (Banerjee and Bell 2007). Although my research falls under the umbrella of ecogender studies it is also informed by the traditions of feminism, ecofeminism, and ecogender studies that call for an integrated approach in which the exploration of gender functions as a critical lens to help shed light on all forms of inequalities and problematic social structures (Banerjee and Bell 2007; King 1990; Warren 2000; Collins 1990, 1998). For example, King (1990) addresses issues of capitalism, hierarchical economic and political structures, hegemony, and the acceleration of technology, and she argues for an ecofeminism that has a critical edge as opposed to an ecofeminism that is essentialist or spiritualist in nature (King 1990; Banerjee and Bell 2007). Although my work does not directly

address issues of capitalism or hegemony, for example, I do believe that looking deeper into the complexities of gender as a socio-demographic correlate of environmental concern applies the feminist framework I espouse to a grounded and practical area of research (i.e. my work is not essentialist).

King does not stand alone; many feminist environmental scholars are working from a political ecology framework and view gender as a critical variable that is interconnected to issues of class and race (Banerjee and Bell 2007). Warren (2000) argues for an ecofeminist philosophy that is "Opposed not only to sexism and naturism, but also to racism, classism, ageism, anti-Semitism, heterosexism, and any other social system of domination (*isms* of domination; p. 68)." Outside of environmental sociology, black feminism argues that sexism, class oppression, and racism are inextricably bound together (Collins 1990). Forms of feminism that strive to overcome sexism and class oppression but ignore race can discriminate against many people, including women, through racial bias and vice versa (Collins 1990). For example, in 1870 the Fifteenth Amendment to the US Constitution declared that citizens would not be denied the right to vote based on race, yet a large portion of black Americans were unable to vote on the basis of their gender. It was not until 50 years later in 1920, with that passage of the Nineteenth Amendment, that black women received the right to vote.

These perspectives represent my theoretical foundation for exploring gender in environmental sociology. For example, I am delving into the mediating and moderating effects of gender and other socio-demographic variables on levels of environmental concern because I believe that our lived experiences lie at the intersection of multiple socio-demographic identities (e.g., one might be a white woman who lives in an urban

area and is Catholic and a Democrat). Although there is a large body of literature exploring gender in relationship to the environment, there is little to explain the interconnections of gender and other factors as they relate to environmental concern. Furthermore, the current ideas about gender within the environmental concern literature base treat women and men as homogeneous groups and do not account for differences that exist among women and among men. The feminist theoretical traditions that serve as a foundation for my intellectual framework as well as the vast body of pervious environmental concern research are explored and discussed at length in Chapters Two and Three respectively.

Research Questions

The purpose of my work is to build on the feminist and environmental concern literature bases by attempting to answer the following research questions:

(1) What are the differences and similarities between and among studies regarding the effects of gender on a variety of measures of environmental concern?

(2) Can patterns be indentified that help explain any differences between the environmental concern of men and women?

(3) Are there mediating effects between gender and socio-demographic factors with regard to environmental concern?

(4) Are there moderating effects between gender and socio-demographic factors with regard to environmental concern?

(5) If there are mediating and moderating effects, are they consistent across a variety of datasets using different samples and different measures of environmental concern?

Although I cannot speculate, a priori, on the direction of interaction effects between gender and other socio-demographic correlates of environmental concern, primarily because the previous research yields inconsistent results and the theoretical explanations are underdeveloped, I do expect to find a number of mediating and moderating effects. Previous researchers (Dunlap and Jones 2002; Klineberg, McKeever, and Rothenbach 1998) suggest that inconsistencies in findings regarding differing levels of environmental concern are largely due to differences in question wording and the various types of environmental concern that can be measured. Again, I do not disagree that the framing of environmental problems is extremely important (see Chapter Three for an in-depth discussion of the complexities involved in measuring environmental concern). However, I do believe that explanations involving question wording are an overly simplified and partial elucidation into the differences between men's and women's levels of environmental concern. I think that exploration of mediating and moderating effects will provide more insight into the complexities of the relationship between gender and environmental concern.

CHAPTER TWO

BACKGROUND LITERATURE: THEORETICAL FOUNDATION

Although the framework presented here may not seem directly relevant to the statistical models I test, I believe it is necessary to include a brief discussion of feminist theory and a conceptualization of ecofeminism in this study, since the central topic is gender and the environment. In addition, several of the perspectives presented here are the inspiration for my own theoretical philosophy in which this project is built around. It is also necessary to note that ecofeminist scholarship varies greatly, and both the articulation and the roots of ecofeminist positions are often debated. Warren (2000) writes (p.21), "Since ecofeminism grows out of and reflects different and distinct feminisms (e.g., liberal feminism, Marxist feminism, radical feminism, socialist feminism), ecofeminist positions are as diverse as the feminism from which they gain their strength and meaning." This chapter will first delineate several feminist traditions that represent a range of inspiration from which ecofeminism has grown (i.e. liberal feminism, radical feminism, socialist feminism, and black feminism) as well as describe the ecological foundation for ecofeminism. This is followed by a brief presentation of empirical research connecting gender and the environment and a discussion of feminist research methods. And lastly a critique of ecofeminism as the essential paradigm of women studying the environment is offered.

Feminist Theory and the Roots of Ecofeminism

Liberal Feminism argues that gender inequality is produced by unequal access (based on sex) to civil rights and certain social resources, such as education and employment (Gaard 1998). Liberal feminism does not directly flow into ecofeminism due to some inherent contradictions. Liberal feminism (although crucial to the liberation of many women) has tended to ignore inequalities produced by race and class oppression and instead has focused on increased access to institutions. But ecofeminism has argued for fundamental changes to our institutions. Nevertheless, liberal feminism as a theory provides ecofeminists with useful tools. The animal rights stream of ecofeminism resonates with the theories of liberal feminists, who might recognize the oppression of animals and women but do not acknowledge the structural currents related to broader inequalities (Gaard 1998).

Radical Feminism, on the other hand, has made a robust contribution to ecofeminism (Gaard 1998). Radical feminism believes that gender inequality is the result of male domination in all aspects of social and economic life, and therefore requires a complete system overhaul (Gaard 1998). The convergence of radical feminism with ecofeminism is represented in the works of Daly (*Gyn/Ecology*) and Griffin (*Women and Nature*), both published in 1978. Each book addresses patriarchy and the accompanying silence of women's voices, and both works concentrate on spirituality and nature. Daly (1978) specifically addresses the silencing of Carson's (1962) *Silent Spring.* The nature and spiritual streams of ecofeminism (radical cultural ecofeminism and spiritual ecofeminism respectively) are influenced heavily on radical feminist theory (Gaard 1998).

Socialist feminism developed in the 1970s and asserted that male domination and capitalism exist alongside one another (Hartmann 1997). But because the majority of feminists have criticized Marx for understanding the oppression of women through the lens of class, claiming that in itself is discriminatory; the popularity of socialist feminism has been fleeting (Vogel 1983). Socialist feminists have attempted to incorporate Marx into their theories while maintaining a strict distinction between gender issues and class phenomenon. This boundary reflects the basic inability of different oppressed groups to amalgamate, which is a direct function of the capitalist system. A division is naturally created between women, gays, lesbians, Blacks, Latinos, and other racial and social groups within society causing dissent among the oppressed instead of dissent by the oppressed. Consequently, socialist-feminism has been, as described by Hartmann (1997), an “unhappy marriage.”

It is often argued that if working class women unite with working class men to battle oppression of the lower class, then the unity between lower class women and upper class women fighting gender discrimination becomes negated, and vice versa (Smith 2005). However, this type of logic undermines the goals and interests of both groups because it implies that either the class struggle or the struggle against patriarchy must dominate and that they cannot simultaneously thrive, without acknowledging the forces that prevent these struggles from coinciding. Black feminism, however, argues that sexism, class oppression, and racism are inextricably bound together. For example, forms of feminism that strive to overcome sexism and class oppression but ignore race can discriminate against many people, including women, through racial bias (Collins

1990). Thus, I argue that black feminism is a more useful lens than socialist feminism for the combined struggles of class, race, gender, and environmental degradation.

The central idea of Collins's book, *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment* (1990, 2000), is the notion that there are intersections of inequality, specifically between race, gender, and class. She further explains that black women sit at a theoretically interesting point where two powerful systems of oppression come together: race and gender. Collins (1990) acknowledges that a homogeneous black woman's stand point does not exist; however, there are common themes among the experiences of black women that create a collective stand point. In other words, the experiences of black women collectively differ from the experiences of white women and black men. I wonder if the environmental concern of black women, white women, black men, white men, and other groups differ according to these intersections.

Additionally, I argue that socialist ecofeminists such as Carolyn Merchant, Vandana Shiva, Maria Mies, and Karen Warren, who highlight the connections between race, class, gender, and nature oppression, are closely related to the theories of Patricia Hill Collins and black feminism (Gaard 1998). To my knowledge, however, black feminism is not discussed within the context of environmental sociology or ecofeminism. Black feminism and vegetarianism represent my inspiration and personal pathway to gender and environmental sociology.

Ecofeminism was not exclusively built from feminist traditions, it is impossible to ignore the link between feminism and deep ecology (although the literature predominately has). Deep ecology advocates build on the preservationist perspective

and the ecocentric paradigm by maintaining that all natural things have intrinsic value (e.g., rocks have rights). Furthermore, humans have a relationship with nature that is endangering the diversity of the biosphere and human impact must be reduced (Brulle 1996). Most of the more radical environmental movements, including ecoterrorism, have branched out of the deep ecology framework, for example Earth First! and Abbey's (1975) *The Monkey Wrench Gang* (Brulle 1996).

Dunlap and Marshall (2006) explain how sociologists' efforts to explain race and gender as social constructs de-emphasized biological and geographical spheres, which resulted in a disregard for the physical world. Environmental sociologists called for a return to biophysical dimensions, yet this was without the variables of gender and race. Ecofeminists then reintroduced gender and race into environmental sociology, and did so without peril to the understanding of the social construction of gender and race.

Empirical Research and Feminist Epistemology

In the tradition of Carson and *Silent Spring* (1962), there is research connecting environmental toxins to the adverse health conditions of women. For example, a 2003 study found an association between length of residence on Cape Code (a peninsula that has been exposed to a variety of contaminations) and cancer in women, a stay of five years or more was associated with a heightened risk of breast cancer (McKelvey, Brody, Aschengrau, and Swartz 2003). Outside of health risks, health technology (specifically the role of reproductive technology), and environmental concern, there has been little empirical research addressing the links between gender and the environment, and much less research testing the multiple streams of ecofeminism.

A lack of empirical research regarding ecofeminism is likely due to the grounding of ecofeminist philosophies in broader feminist literature, including feminist methodologies that have for decades challenged positivistic models of doing research. Mies and Shiva provided seven guidelines for feminist research in their book titled Ecofeminism (1993). These methodological principles are positioned against the objective pursuit of knowledge and similar to other feminist methodological approaches, such as those espoused by Collins in *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment* (1990, 2000). The methodological guidelines of Mies and Shiva (1993) are summarized as follows: (1) conscious partiality should replace value neutral research (2) research should serve the interests of subjugated groups, specifically women, as opposed to the use of research to legitimize power structures (3) research should be actively involved in struggles for emancipation (4) research inevitably involves processes of change, including a change in paradigm for the researcher herself (5) research must involve consciousness-raising (6) research must be accompanied by the delineation of a women's history and (7) women need to engage in the collective organization of their own experiences.

Collins (1990) created a theory of knowledge known as black feminist epistemology that requires a shift from binary thinking to an acknowledgement of complex realities and intersections of inequalities. Central to black feminist epistemology are the ideas that (a) the politics of race and gender also influence knowledge and (b) scientific knowledge has hindered social reform. There are four components to black feminist epistemology that distinguish it from the positivistic approach. (1) First, according to positivism true or correct knowledge only comes when

the observer separates him or herself from what is being studied (this is to safeguarding against bias). The alternative: knowledge begins with “connected knowers,” those who know from personal experience. (2) Second, positivism asserts that personal emotions must be set aside in the pursuit of pure knowledge. The alternative approach advocates for the use of dialogue. Pronouns such as ‘I’ and ‘We’ should be used instead of distancing language. Rather than disappearing, the author is central to and present in the text. (3) Third, positivism requires that no personal ethics or values must come into research. The alternative espouses an ethics of caring. All knowledge is value laden, not value free. Knowledge should be tested by the presence of empathy and compassion. The presence of emotions indicates that the speaker believes in the validity of the argument. Black feminist epistemology does not require separation nor does it assume that it is possible to separate thoughts from feelings. (4) Lastly, positivism claims that knowledge progresses through accumulation and adversarial debate. The alternative requires personal accountability. Positivism demands objectivity (the possibility of which is certainly questionable). Black feminist epistemology suggests that objectivity leads to the separation of personal responsibility from knowledge, and instead advocates for holding the knower directly accountable. Collins (1990) asks social scientists to assess which form of knowledge is more likely to lead to social justice: one that denies ethical and moral accountability or one that demands it?

Not all feminist methodologies call for a complete rejection of positivistic principles, yet all are critiquing the dominate research paradigm. Feminist empiricism, for example, claims that scientific knowledge can be used to undermine racist ideas and

promote democracy (Harding 1990). In other words, it can be harnessed for progressive means and the advancement of social justice does not need to be absent form the process. Feminist empiricists acknowledge that the androcentric and sexist methods of traditional scientific inquiry are indeed flawed. However, they caution against a result that completely denounces the scientific method, conversely it is a stricter adherence to methodological norms that will result in greater equality of the scientific process (Harding 1990). I would consider myself most closely aligned with the principles of feminist empiricism.

Understanding feminist methodological approaches is essential to evaluating the philosophies of ecofeminism. Harding (1990) suggests in her article *Feminism, Science, and the Anti-Enlightenment Critiques* that people create theories of knowledge because their beliefs and the foundation for those beliefs are challenged. As Mies, Shiva, and Collins all illustrate methodological approaches are more than a means to knowledge, they represent a belief system. For example, Mies and Shiva (1993) critique research on values and concern as superficial because it typically does not acknowledge the construction of those values and oppressed women are women are likely to misrepresent their true values.

A Critique of Ecofeminism

The fundamental criticisms of ecofeminism include: the romanticization of nature and non-western cultures, an over reliance on a spiritual perspective, the homogenization of women, and the privileging of women's experiences (Banerjee and Bell 2007). This is not an exhaustive list but it has been enough to justify a lack of

emphasis on ecofeminist scholarship. For example, Shiva's "feminine principle" calls for society to embrace the virtues of women such as reproduction, emotional sensitivity, and our spiritual connections to nature (Shiva 1989; Bell 2004). First this suggests that all women are emotionally and spiritually centered. Second, critics argue that this position perpetuates gender socialization and the hierarchical social structures that other feminists are fighting against (Bell 2004).

Additionally, themes of essentialism and romanticization as illustrated in Mellor's (1997) description of the Chipko movement are highly criticized. Banerjee and Bell (2007) point out the complexity of the Chipko movement, including the involvement and leadership of males, and the geographical and historical context of the movement, which undermines the myth of the Chipko movement as an ecofeminist spirited project. Although I understand and often agree with the criticisms of traditional ecofeminist perspectives, it is a shame that these criticisms frequently serve to weaken the fundamental value of the theories themselves. As theories of historical importance, I believe that ecofeminist literature should be more integrated into the sociology curriculum, especially environmental sociology foundational courses. Gaard (1998) further points out problems with the trend for white elites to label and represent the movements of non-whites as ecofeminist, yet they themselves have not done so.

Environmental sociology is often categorized into sub-areas of research (i.e. values, risk, political ecology, ecogender, environmental justice, environmental movements, etc.). Often these categories are useful, yet they are not necessarily mutually exclusive. For example, using the lens of gender to better understand environmental problems does not require an abandonment of the political ecology

framework. I believe the beginning of an alternative to the traditional ecofeminist perspectives actually stems out of a branch of ecofeminism itself. King (1990) addresses issues of capitalism, hierarchical economic and political structures, hegemony, and the acceleration of technology, and she argues for an ecofeminism that has a critical edge as opposed to an ecofeminism that is essentialist or spiritualist in nature (King 1990; Banerjee and Bell 2007).

King does not stand alone; many feminist environmental scholars are working from a political ecology framework and view gender as a critical variable that is interconnected to issues of class and race (Banerjee and Bell 2007). When I first read Warren (2000), a self proclaimed ecofeminist philosopher, I began to understand the utility of ecofeminism. Warren (2000) argues for an ecofeminist philosophy that is "opposed not only to sexism and naturism, but also to racism, classism, ageism, anti-Semitism, heterosexism, and any other social system of domination (*isms* of domination)" (68). It is out of these perspectives (nonessentialist ecofeminism and political ecology) that Banerjee and Bell (2007) propose ecogender studies:

> Ecogender studies encompasses those versions of ecofeminism that envision a dialogic interplay of ideas across gender, class, race, and caste; that focus on women's and men's experiences equally; and that avoid essentialism, the sacralization of nature, and the romanticization of non-Western traditions. It also draws on feminist political ecology's understanding of gender as a critical variable in exploring ecological change. Ecogender studies thus can be defined as social scientific research on the gendered and relational quality of embodied environmental experience. And while ecogender studies enters the dialogue of

> social difference at a gendered moment, it immediately seeks to make connections with other moments of social difference, such as class, caste, and race, and investigates the forms and processes of these intersections (6-7).

This is the theoretical foundation for gender in environmental sociology that I espouse. Ecogender studies is not original in its entirety and it is not the only possible alternative to ecofeminism, but it is well articulated and captures the aspects of sociology I find most compelling. Due to the critical nature of ecogender studies and its emphasis on interconnected inequalities, it is a framework that allows for the advancement of social justice, a priority I believe the discipline of sociology should adopt and certainly a priority for my own work.

Although feminist scholarship has made an impact on sociology, feminist scholarship is also too frequently dismissed both inside and outside the realm of environmental sociology. A study by Thomas and Kukulan (2004) found that less than twenty percent of undergraduate sociology theory courses assign the writings of women theorists. I am currently working on a content analysis of undergraduate syllabi for methods courses, and preliminary findings suggest that feminist methodologies are not being taught at an undergraduate level. I believe that ecogender studies will have a greater impact in environmental sociology if feminist scholars are simultaneously advocating for the advancement of feminist theory and feminist methodology within sociology as a discipline at large. Not that feminist theory or feminist methodologies are the only or best approaches, but they are tools available for the advancement of the disciple and should be built upon as such.

Furthermore, I believe that a true transformation of environmental sociology will be reflected when ecogender research (or other forms of feminist ecology) is conducted by men and women alike (for gender studies represents issues of masculinity as well). Additionally, I hope that ecogender studies might provide a framework that allows for a better integration of environmental sociology and other areas of research. Political economy and environmental sociology have integrated together nicely, other areas are currently emerging. Recently at the American Society for Criminology conference I observed the hot topic of "green criminology." I think the integration of sub-areas within sociology and the collaboration of sociology with other disciplines is going to be crucial to solving our current, pervasive ecological crisis. And of course it is even more essential to add an ecogender lens to other areas of environmental sociology. Warren (2000) states boldly that any perspective failing to consider the interconnections of gender is "simply inadequate."

CHAPTER THREE

BACKGROUND LITERATURE: ENVIRONMENTAL CONCERN

The study of environmental concern is a vast, heavily disputed, and multi-disciplinary field (Satterfield and Kalof 2005). Dunlap and Van Liere (1978, 1984) launched the beginning of assessment research that examines the level of concern individuals have about the environment (Stern, Dietz, and Kalof 1993). This research has largely focused on the assessment of a paradigm shift from the *dominant social paradigm*, that science and technology will solve societal problems, to a *new environmental (or ecological) paradigm*, which represents a commitment to environmental protection (Stern, Dietz, and Kalof 1993; Dunlap, Van Liere, Mertig, and Jones 2000). An increasing volume of research attempts to differentiate the characteristics of those who have adopted a positive environmental perspective from those who have not (Stern, Dietz, and Kalof, 1993; Schahn and Holzer 1990).

In 1980 Van Liere and Dunlap summarized a decade of research regarding the socio-demographic correlates of environmental concern and identified several key variables that predict these concerns: sex and gender, age, social class and education, political orientation, and residential type. Jones and Dunlap (1992) added to the knowledge base with a longitudinal analysis of these variables and Jones and Carter (1994), Mohai and Bryant (1998), Jones (1998, 2002), and Mohai (2003) aided our understanding of the relationship between race and environmental concern. More recently, however, trends in environmental concern research have shifted in several ways.

First, there is a growing body of work that evaluates how people feel about global warming, with the idea that outcome measures of climate change operate differently than general environmental concern variables (Hamilton 2009; Nisbet and Myers 2007; Dunlap and McCright 2008; Shwom, Dan, and Dietz 2008; Krosnick, Holbrook, Lowe, and Visser 2006). Second, there is an increasing volume of research looking at cross-national comparisons in environmental concern (Adeola 2004; Olofsso and Öhman 2006; Lorenzoni and Pidgeon 2006; Alibeli and Johnson 2009; Xiao and Hong 2009).

Third, researchers are using socio-demographic variables as mere controls while focusing more on psychosocial predictors of environmental concern. A cursory review of the most recent work on environmental concern shows a tendency to control for gender, age, income, and education without critical consideration of the mechanisms by which these factors operate (Hamilton 2009; Hamilton 2008; Hamilton and Keim 2009; Olofsso and Öhman 2006; Dietz, Fitzgerald, and Shwom 2005). Of course the intent of these articles is not to explain the relationship between these socio-demographic factors and environmental concern, but I mention them to illustrate the ubiquity with which these factors are used even though we still do not fully understand the mechanisms by which these variables operate.

In order to better understand how environmental sociologists think about gender it is necessary to explore how they conceptualize *all* socio-demographic correlates of environmental concern. It is also important to realize that there are a set of predictors including gender and age that are now considered the standard predictors of environmental concern. Despite their widespread use in models predicting

environmental concern, many researchers have stopped attempting to explain the mechanisms by which they operate.

Socio-demographic Characteristics of Environmental Concern

Sex and Gender

Van Liere and Dunlap (1980) report little consensus regarding the impact of sex[3] on its relationship to environmental concern. Some have hypothesized that men have a greater concern for the environment than women due to higher levels of political action, education, and community involvement among men. Others have hypothesized that men have a lower level of environmental concern than women because of competing interests, that is, men are concerned with economic issues and this comes at the expense of environmental concern (Van Liere and Dunlap 1980). Van Liere and Dunlap (1980) note that the impact of sex on environmental concern is inconclusive, with the direction of the relationship varying among studies and weak associations reported. However, at the time of their study, little attention had been focused on the relationship between sex and environmental concern. A decade later, Jones and Dunlap (1992) reported no significant differences between gender and environmental concern when reviewing the literature; however, they do indicate that, when differences are found, women are more environmentally concerned than men.

In the nineties, Davidson and Freudenburg (1996) revisited the relationship between gender and perceptions of environmental risk, in a study whose goals parallel

[3] The term "sex" is used here because it is used by the original authors; I believe that the decision offered by Van Liere and Dunlap more accurately relates to gender.

Van Liere and Dunlap's (1980). That is, they summarized existing literature and made general conclusions about the current state of knowledge (at that time) regarding gender and environmental concern. First, Davidson and Freudenburg (1996) established that research consistently indicates that women tend to express greater levels of concern for the environment than men. Second, they identified five hypotheses used throughout the literature to explain these gender differences. (1) Having more technical knowledge about the environment leads to less concern about environmental risks. The assumption behind this hypothesis is that men have more scientific knowledge than women, thus women are more concerned about environmental risks than men. This rationale has received little empirical support (see e.g., Lyons and Breakwell 1994; Brody and Fleishman 1993; Schahn and Holzer 1990). (2) Women are more concerned about the environment when the risks involve issues of health or safety. This hypothesis, known as the *safety concern hypothesis*, has consistently received empirical support (see e.g., Brody 1984; Solomon, Tomaskovic-Devey, and Risman 1989). (3) Women are less trusting of institutional structures and therefore more concerned about environmental risk. Davidson and Freudenburg (1996) found evidence (in six of eight studies) that men are more trusting of institutions than women and found support (in seven of nine studies) for the negative association between institutional faith and environmental concern (see e.g., Slovic, Flynn, and Gregory 1994; Bord and O'Connor 1992; Dunlap, Rosa, Baxter, and Mitchell 1993; Hoban, Woodrum, and Czaja 1992). (4) Men have more concern for economics than women, and this leads to less concern for the environment. This hypothesis is referred to as the *economic salience hypothesis.* Davidson and Freudenburg (1996) found

inconclusive support for this hypothesis (see e.g., Stout-Wiegand and Trent 1983; Brody 1984). (5) Men with young children are less concerned about the environment while women with young children are more worried about environmental risk. This hypothesis is a reflection and magnification of both the *economic salience hypothesis* and the *safety concern hypothesis*; when men have children they have increased economic responsibilities, and when women have children, they have increased safety concerns. The results of studies testing men's parental roles have produced varied results. However, studies examining women's parental roles have shown moms to exhibit a greater concern for environmental risk than both dads and women without children (Davidson and Freudenburg 1996; see e.g., Blocker and Eckberg 1989; Bord and O'Connor 1992).

The ideas synthesized by Davidson and Freudenburg (1996) are now thirteen years old and the literature they reviewed is older. Since the early seventies, women have had increased investment and involvement in the economic sector, family roles and relationships have evolved to become less gendered, and as the general public and politicians focus more on environmental problems, knowledge about the environment has become more salient for all. For example, the gender wage ratio (women/men) has steadily increased from 63.1 in 1973, 73.1 in 1989, 76.7 in 1995, 78.0 in 2000, to 81.5 in 2007 (Mishel, Bernstein, and Shierholz 2008-2009). Furthermore, 49 percent of children had mothers in the labor force in 1980, as opposed to 59 percent in 1990, and 70 percent in 2000 (Hernandez 2005)[4]. Despite these and other changes, research in the

[4] See Feminist Literature section in this chapter for a more in-depth discussion of gender theory and potential theoretical explanations for gender differences in levels of environmental concern.

area of gender and environmental concern has stalled. In 2009, Hamilton, while controlling for gender, found that women have greater concern about the threat of global warming than men; he then referenced readers to Davidson and Freudenburg (1996) for more information about this relationship.

Age

Van Liere and Dunlap (1980) conceptualize the *age hypothesis* by proposing that younger people have a greater concern for the environment than older people; in other words age and environmental concern are negatively correlated. Theoretical explanations for the *age hypothesis* can be split into two categories: (1) age-group differences and (2) cohort effects (Van Liere and Dunlap 1980). Age-group differences are explained by the ages at which people tend to integrate into different social roles. For example, younger people typically are not as integrated into economic and political roles or institutions as are older people. Since environmental decisions are often (strategically) positioned against economic and social interests, older people are making choices between competing value sets whereas younger people are making more ideological choices (Van Liere and Dunlap 1980).

Cohort differences, however, reflect a particular political and social climate over varying historical periods of time. For example, the research summarized by Van Liere and Dunlap (1980) was representative of a time period where young adults were exposed to both the political crisis of the Vietnam War and increased social threats to the previous gains in civil rights, this was coupled with a growing knowledge about environmental degradation. This unique set of circumstances was expected to yield cohort effects with respect to levels of environmental concern. The cohort perspective

forecasts a similar level of environmental concern across time among generational groups as they get older, for example, if a cohort was exposed to circumstances which resulted in high levels of environmental concern, this would predictably be a lasting effect. Obviously, the cohort difference explanation contradicts the age-group differences theory (Van Liere and Dunlap 1980).

Overall, Van Liere and Dunlap (1980) found that the majority of studies indicate support for the *age hypothesis*, although some findings indicate only a slight relationship between age and environmental concern and a few others report no relationship. Originally, during the sixties, researches suggested that age was positively correlated with environmental concern, but this hypothesis has not been supported (Van Liere and Dunlap 1980). However, I wonder if the age effect is fully understood, as the interaction of age with other factors—I am especially interested in the interaction of age with gender—has not been explored.

Support for the *age hypothesis* is evident in longitudinal studies as well (Van Liere and Dunlap 1980). Jones and Dunlap (1992) use data from the National Opinion Research Center's General Social Surveys (1973-1990) to evaluate changes over time in the social and demographic correlates of environmental concern. Jones and Dunlap (1992) found age to be the most consistent and strongest predictor of environmental concern (in a negative direction), such that younger adults tend to be more concerned with the environment than do older adults. These consistent, longitudinal findings seem to provide more support for the age-group difference than the cohort effects hypothesis.

Furthermore, with an increase in studies looking at global warming, Hamilton (2009) found, while controlling for age, that older respondents were less likely to view

global warming as a threat than younger respondents. He suggests that this might be due to their shorter life expectancy and the accompanying idea that older adults will not likely see the harshest effects of global warming themselves. I find this logic to be problematic on several levels: (1) it implies that older people are only concerned about themselves (and not the health and safety of their children or their legacy) and (2) it ignores the increasing evidence of the destruction associated with global warming (e.g., hurricanes and tsunamis). Furthermore, differences in mortality by gender and race can lead to older populations with large proportions of women and whites (Danigelis, Hardy, and Cutler 2007), these complex factors are not accounted for as scholars control for age and cite Van Liere and Dunlap's (1980) established findings. In addition, Danigelis, Hardy, and Cutler (2007) found no evidence to suggest that aging people are inflexible, resistant to changing values, or increasingly conservative in their socio-political attitudes (as is often assumed by popular culture). Thus, there is little reason to think that age alone would account for differences in environmental concern between younger people and older people.

Race

Van Liere and Dunlap did not include race as a demographic correlate in their 1980 review of the literature because at the time there was too little research available for review. An understanding of race's relation to environmental concern has increased markedly since the publication of Van Liere and Dunlap's 1980 review and Jones and Dunlap's 1992 longitudinal study (see Jones 1998; Jones 2002; Jones and Carter 1994; Mohai 2003; Mohai and Bryant 1998). Mohai and Bryant (1998), Jones (2002), and Mohai (2003) have made great strides in rejecting the myth that environmental concern

is only present among whites and that blacks are uninterested in environmental protection. In fact, in some cases blacks were found to express greater concern for the environment than whites (Mohai and Bryant 1998; Jones 2002; and Mohai 2003). In addition Jones (2002) found no support for the *economic contingency hypothesis*, which states that economically vulnerable groups such as minorities, people living in poverty, and the working class, express a decline in concern for the environment during periods of economic decline (Jones, 2002). Instead Jones (2002) suggested that the environmental attitudes and opinions of blacks are less susceptible to fluctuations in the economy than the environmental concern of whites.

Furthermore, Jones (2002) addressed issues of environmental racism and discrimination as related to the myths about blacks lack of concern for the environment and calls for environmental issues to be framed in a way that do not exclude concerns about urban environments. More recently, research has directly examined the link between issues of environmental justice and environmental concern. Jones and Rainey (2006) found, for example, that blacks are more likely than whites to believe they are exposed to poor environmental conditions and suffer poor health as a consequence of environmental pollution. Additionally, blacks are more likely than whites to believe that government agencies do not provide satisfactory protection from such injustices – a fact that environmental justice scholars have been documenting for sometime (Jones and Rainey 2006; also see Bullard 1990; Wilkinson and Freudenburg 2008).

The one area where environmental concern scholars have addressed gender as it relates to other socio-demographic variables is race. Finucane, Slovic, Mertz, Flynn, and Satterfield (2000) looked at the interaction between race and gender as it relates to

perceived risks. White men always rated potential hazards as lower risk than non-white men, white women, and non-white women. These risks include non-environmental hazards such as multiple sexual partners and street drugs as well as environmental hazards such as nuclear power plants and pesticides. In contrast, non-white women often (but not always) rated hazards as higher risk than other groups (i.e., white women, non-white men, and white men). Finucane, Slovic, Mertz, Flynn, and Satterfield (2000) suspect that these differences in opinion are a result of opportunity costs, that is white men have the most to gain (are the most likely to reap the benefits) from potential hazards, where as women and minorities are potentially at the greatest risk from exposure to hazards.

Similarly Kalof, Dietz, and Guagnano (2002) found that, in general, white men are less likely to endorse a pro-environment paradigm than non-white men, white women, and non-white women, most likely because of their historically privileged status in society. Marshall (2004) looked at the *white male effect* in a notoriously polluted region along the Mississippi River and found analogous results. White men expressed less concern about environmental hazards than non-white men, white women, and non-white women, and black women expressed the greatest concern for environmental hazards among the other groups. Again, Marshall (2004) argues from an environmental justice perspective that black women feel the most vulnerable because they are vulnerable, and the lack of concern for environmental hazards among white men is because they are the most likely to profit from hazards and they are least vulnerable to environmental risks.

Social Class

In direct contrast to the *vulnerability perspective*, that those most vulnerable to environmental risks are the most concerned, Van Liere and Dunlap (1980) delineate the *social class hypothesis,* predicting that environmental concern increases as levels of education, income, and occupational status increase (i.e. there is a positive correlation between environmental concern and social class). Theoretical explanations for the *social class hypothesis* primarily rest on Maslow's (1970) hierarchy of needs and theories of relative deprivation (Van Liere and Dunlap 1980). Maslow's (1970) theory delineates a hierarchy of needs where lower order, or basic, needs such as food, shelter, and safety must be met before higher order, or luxury, needs such as love and self-actualization can be satisfied. Environmental quality has typically been classified as a higher order need; although many within environmental sociology argue that our dependent relationship with the physical environment is directly related to the lower order needs as Maslow characterized them (i.e. food and shelter).

Nevertheless, as the argument goes, if concern for the environment is perceived as a higher order need then it is a luxury those of the lower social classes cannot afford (Van Liere and Dunlap 1980). Similarly, theories of *relative depravation* suggest that those of lower class status are less concerned with environmental quality because they have not had exposure to surroundings that embody high levels of environmental concern. In other words, pollution is normalized and lower class communities are unaware of alternatives (Van Liere and Dunlap 1980). This logic is obviously outdated and has inherent flaws aside from being in direct contradiction to the *vulnerability perspective*: (1) given today's wide access to television and the internet, individuals are

likely aware of alternative living conditions and (2) it is based on the assumption that individuals in lower incomes are not capable of making associations between environmental hazards and health and safety problems.

In order for Van Liere and Dunlap (1980) to test support for the *social class hypothesis* they separated it into its three components: (1) education, (2) income, and (3) occupational prestige. Van Liere and Dunlap (1980) did not find support for the relationship between income and environmental concern and occupational attainment and environmental concern (both hypothesized to be a positive relationship). The evidence for the income dimension of the *social class hypothesis* was too ambiguous, with some studies reporting a slight positive correlation while others report a negative relationship, and longitudinal studies suggest a changing relationship over time (Van Liere and Dunlap 1980). The evidence for the occupational status dimension of the *social class hypothesis* was simply too weak to conclusively say that a positive relationship exists. Jones and Dunlap's (1992) longitudinal study (1973-1990) also failed to find a significant relationship between family income and occupational prestige as predictors of environmental concern.

Since these earlier studies, scholars have still not been able to establish a clear and direct relationship between class and levels of environmental concern. However, researchers almost always include class as a control in their models because of its confluence with many other socio-demographic characteristics (e.g., gender, race, education, and political orientation). Furthermore, the discussion of class has shifted from a direct discussion of class to include more of an environmental justice perspective, that is that people belonging to vulnerable groups (included those of lower

socioeconomic classes) have less control or influence over their exposure to environmental hazards and thus express greater levels of concern (Finucane, Slovic, Mertz, Flynn, and Satterfield 2000).

Education and Scientific Knowledge

The relationship between education and environmental concern has been much more established than the relationship between socioeconomic status and environmental concern. Overall, Van Liere and Dunlap (1980) found that the majority of studies show support for a positive correlation between education and environmental concern, although some findings indicate only a weak relationship and a few others report no relationship. Jones and Dunlap's (1992) longitudinal study (1973-1990) also found evidence to support that those with higher levels of education tend to have slightly greater levels of environmental concern.

This well established positive correlation between education and environmental concern is, however, in direct contradiction to hypotheses and findings regarding other socio-demographic characteristics. For example, given the direct correlation between education and income and education and race, there is a contradiction between the *vulnerability perspective* and the *education hypothesis*. How can we reconcile the findings that groups that are more vulnerable to environmental hazards (e.g., black women) express greater concern for the environment than members of less vulnerable groups, yet groups that are less vulnerable to the risks associated with environmental hazards (e.g., the upper class and whites) are more likely to have higher levels of education, which is positively correlated with greater levels of environmental concern?

Increasingly studies are looking at scientific knowledge as a predictor of environmental concern. Scientific knowledge represents a respondent's knowledge of science (also known as science literacy) as opposed to a respondent's number of years of education or a respondent's highest degree earned (Hamilton 2008; Hamilton 2009; Hamilton and Keim 2009). Scientific knowledge is assessed by asking respondents to answer basic science questions (e.g., name an element on the periodic table) or asking respondents about their belief in evolution or their understanding of the processes of global warming. It is hypothesized (and has been found) that those with a greater understanding of science (and by extension global warming) are more likely to identify with a pro-environment paradigm than those who have less scientific knowledge (Hamilton 2008). This finding is encouraging because it implies that public education and awareness will increase public concern for environmental problems.

However, Hamilton (2008) notes that, "Science literacy varies with background characteristics such as respondent's age, gender, income and education." For example, income and education have been shown to be positively associated with scientific knowledge and scientific knowledge tends to be higher among men than women (Hamilton 2008). Guagnano and Markee (1995) found that women are more likely than men to report environmental problems as difficult to understand and confusing. So if men have higher levels of scientific knowledge then why are they consistently expressing lower levels of environmental concern than women?

The *scientific knowledge hypothesis* is in direct contrast to one of the hypotheses tested by Davidson and Freudenburg (1996): women express greater concern for the environment than men because men have more technical knowledge about the

environment which leads to *decreased* concern. Davidson and Freudenburg (1996) did not find evidence to support this, yet it has been argued repeatedly as a factor to explain gender differences in environmental concern (Hamilton, Colocousis, and Duncan 2010). It is reasoned that some women have an *irrational* fear or concern for environmental problems because they lack the technical knowledge to understand natural processes and are thus afraid of the unknown (Finucane, Slovic, Mertz, Flynn, and Satterfield 2000). Yet, there is a general consensus among scientists that global warming is highly problematic (Dunlap and McCright 2008).

Given these complex relationships between socio-demographic characteristics, scientific knowledge, and levels of environmental concern Hamilton (2009) calls for researchers to look for interaction effects between variables of interest, and specifically for interactions between science literacy and other predictors (see section on political orientation; Hamilton 2009; Hamilton and Keim 2009). For example, if income predicts scientific knowledge and scientific knowledge predicts concern for the environment, and if men and women have different levels of scientific knowledge and income[5], then there is likely the presence of multiple mediating and moderating effects.

Political Orientation

Van Liere and Dunlap (1980) discuss the political hypothesis as one that expects Democrats or those with a politically liberal orientation to have greater concern for the environment than those who hold a Republican or politically conservative position. This hypothesis specifically contradicts the idea that universal (or bipartisan) concern for

[5] In large, national datasets income is often measured at the household level making class differences between men and women difficult to assess.

environmental quality becomes more prolific as awareness of environmental problems increase and environmental conditions perpetually deteriorate (known as the *broadening base hypothesis*; Van Liere and Dunlap 1980; Jones and Dunlap 1992). Three complementary explanations support the political hypothesis: (1) environmental policy is typically opposed by corporations who, in turn, tend to support the political campaigns of conservatives, (2) the implementation of environmental policy requires increased government involvement including increased oversight and regulations, and (3) enacting environmental policy requires creative change (Van Liere and Dunlap 1980). Republicans and other conservatives have historically sided with big business, overtly opposed increased government involvement, and resisted sweeping changes (Van Liere and Dunlap 1980).

Van Liere and Dunlap (1980) found that Democrats exhibited more environmental concern than Republicans; however, most studies report small coefficients, indicating a weak association. Yet, there was strong evidence that political liberals are more environmentally concerned than political conservatives (Van Liere and Dunlap 1980). Jones and Dunlap (1992) report similar findings: liberal political ideology predicts positive levels of environmental concern and Democrats have a slightly greater level of environmental concern than Republicans. Dunlap and McCright (2008) recently found that the gap between Democrats and Republicans is widening, with Democrats tending towards higher levels of support for environmental protection. Dunlap and McCright (2008) suggest that the assessment of overall trends, which indicate an overall increase in support for the environment, hides divergent views between Democrats and Republicans. Increasing political party polarization as reported by

Dunlap and McCright (2008) demonstrates further rejection of the broadening base hypothesis (Jones and Dunlap 1992). For a discussion of how the US conservative movement and ideology has impacted environmental policy (e.g., the failure to ratify the Kyoto Treaty) see McCright and Dunlap (2000; 2003).

Hamilton (2009) and Hamilton and Keim (2009) found an interaction between political party and scientific knowledge with regard to concern for global warming. It was found that, among Democrats, concern for global warming increases with increased scientific knowledge but among Republicans, concern for global warming decreases with increased scientific knowledge (Hamilton, 2009; Hamilton and Keim 2009). Given women's greater tendency to affiliate with the Democratic Party and to hold slightly more liberal ideologies (Edlund and Pande 2002), I anticipate that there is evidence for mediating and moderating effects between gender and political orientation with regard to environmental concern.

Geographic Place of Residence (Urban versus Rural)

Van Liere and Dunlap (1980) describe the residence hypothesis by proposing that those living in an urban environment have greater environmental concern than those living in rural locations. It is assumed that living in an urban environment is equated with higher levels of pollution and other poor environmental conditions, thus, it is theorized that these deteriorated conditions lead to greater levels of concern about environmental quality[6] (Van Liere and Dunlap 1980). Conversely, those living in rural

[6] This is in direct contradiction to the *relative deprivation* perspective that suggests that pollution becomes normalized and of little concern in communities that experience high rates of environmental degradation. Furthermore, given the rural location of many industrial polluting facilities, the assumption of the *residence hypothesis* should predict increased environmental concern in communities proximal to these facilities (regardless of their rural location).

environments have a more traditional, utilitarian relationship with their environment (i.e. direct engagement with their environment via extraction and farming). A rural lifestyle, as represented by agrarian occupations and a corresponding utilitarian culture, is speculated to result in lower levels of concern for environmental protection (Van Liere and Dunlap 1980). Furthermore, it is also suggested that small towns seeking economic growth might favor economic expansion at the potential expense of environmental concern (Van Liere and Dunlap 1980; Bohon and Humphrey 2000).

The support for a positive relationship between urban residence and environmental concern is not consistent across studies (Van Liere and Dunlap 1980). Van Liere and Dunlap (1980) found that the direction and strength of the relationship varies across studies according to the type of environmental concern tested (e.g., awareness of problems versus support for policy changes). Interestingly, some studies suggest that when local environmental conditions are assessed (as opposed to using a more global scope of environmental problems) there is a strong relationship between place of residence and environmental concern (Van Liere and Dunlap 1980). Jones and Dunlap (1992) found that both those raised in urban locations and those currently residing in urban settings are more concerned for environmental quality than their rural counterparts. Additionally, growing up in urban locations (operationalized as living in an urban residence at age sixteen) is a slightly stronger predictor of environmental concern than place of current residence (Jones and Dunlap 1992).

The urban/rural differences proposed in 1980 (Van Liere and Dunlap) are narrowing over time. Jones, Fly, Talley, and Cordell (2003) explore the increasing level of environmental concern now seen in rural areas. Their findings indicate that the

structure of rural communities is changing primarily because of in-migration, which consequently requires a re-evaluation of previous assumptions. For example, the previous theoretical rationale assumed that rural communities are engaged in extractive relationships with nature, but Jones and his colleagues (2003) suggest that an increase in in-migration to rural communities may alter a communities' occupational composition so that there is less preoccupation with extractive and agrarian traditions. Differences that emerge between long-term residents and in-migrants of rural areas are primarily related to socio-demographic characteristics, levels of community participation, and commitment to environmental concern. In-migrants were found to be more educated, more affluent, have higher levels of participation, and a hold a slightly greater level of environmental concern than long-term residents (Jones, Fly, Talley, and Cordell 2003). The implications of these findings for rural communities are yet to be determined, but the results do require an adjustment from previous thinking.

Increasingly the effects of geographic place of residences on measures of environmental concern are being considered in combination with other factors. For example, Hamilton, Colocousis, and Duncan (2010) found that those living in counties with low unemployment rates are more likely than those living in areas with high unemployment rates to favor the preservation of natural resources over the immediate use of natural resources to create jobs. Similarly, Hamilton and Keim (2009) found that those living in geographic areas that have experienced winter warming with decreased snow are more likely to be concerned about global warming than those who live in areas that have not yet felt the impacts of global warming.

Marital Status and Children

Martial status and number of children, unlike the socio-demographic characteristics discussed thus far, have received little empirical attention and are not commonly used as control variables in models predicting levels of environmental concern. However, given the gendered focus of this study, including martial status and number of children as predictors of environmental concern seems prudent. In addition, as noted previously the *maternal role* has been used to explain gender differences in environmental concern, that is, it has been asserted that women with children express greater levels of environmental concern than women without children and/or men with children (Davidson and Freudenburg 1996).

Blocker and Eckberg (1997) tested family roles on levels of environmental concern and found little evidence to suggest that family roles influence women's environmental perspectives. In fact, they found that women who report being "homemakers" tend to express lower levels of environmental concern than women in the labor force. They also found no differences in levels of environmental concern between men and women who have children under the age of six in the house and those who do not. Instead, Blocker and Eckberg (1997) suggest that family roles operate through other variables such as political orientation, social status, and religion. Given Blocker and Eckberg's (1997) study and the problems I associate with the use of the *maternal role* to explain gender differences in levels of environmental concern (as discussed in Chapter Two), I expect to find little evidence for differences by gender regarding both marital status and number of children.

Religious Identification

Similar to marital status and presence of children, religious identification as it relates to concern for the environment has not been studied as exhaustively as other socio-demographic characteristics. Nevertheless, given the impact of religion on socio-political values and American culture (the United States is the most religious industrialized nation; Kimmel 2011) I believe it is necessary to include religion in this study. For example, some religious doctrines and institutions have actively promoted male domination yet women are more likely to "be" religious (this includes participation in religious services, prayer, and reading of religious texts; Kimmel 2011). A recent New York Times article published on March 30, 2011 discusses the announcement made by a committee of American Roman Catholic bishops to encourage the ban of a book titled *Quest for the Living God: Mapping Frontiers in the Theology of God* by Elizabeth Johnson (2007), a prominent theologian known for her work on ecofeminism. Religion also affects family roles and divorce rates: fifty-four percent of marriages between non-religious Americans end in divorce whereas only 39 percent of marriages between religious Americans end in divorce (Cherlin, 2009). Furthermore, Hamilton (2008) found a relationship between religious affiliation and scientific literacy; he found that those with a strong religious identification are less likely to report that they believe in evolution than those who do not identify as religious.

I think it is feasible to expect religion to operate in relation to concern for the environment in one of two ways. On the one hand, almost all religions promote stewardship, responsibility, and a focus on things other than the self. Given this narrative, it is reasonable to expect religious identification (regardless of denomination)

to be associated with a sense of environmental concern. There are examples of this: organizations such as Lindquist Environmental Appalachian Fellowship (LEAF) actively work to protect the local environment through their Christian principles and there are multiple publications focusing on the connection between religion and environmental protection (i.e. The Green Bible 2008; Serve God, Save the Planet 2006). Futhermore, Deemer and Lobao (2011) found religious beliefs to be associated with increased concern for animal welfare.

On the other hand, religion might decrease concern for the environment in a similar manner to the way it negatively affects belief in evolution (Hamilton 2008). Fundamental Christians are more likely to be associated with the Republican Party and conservative movements (Barreto and Bozonelos 2009), both of which have been found to be associated with less environmental concern (Dunlap and McCright 2008; Hamilton 2009; Jones and Dunlap 1992). For example, Deemer and Lobao (2011) found church attendance to be negatively correlated with concern for animal welfare. Perhaps the two potential effects of religion on environmental concern cancel each other out: Boyd (1999) found religion to be an inconclusive and weak predictor of environmental concern.

Measuring Environmental Concern

All researchers must be careful with the interpretation of their data, however, value based researchers are especially at risk of false interpretations because of the deeply embedded context of values and concerns (Jones 1998). There are a plethora of challenges facing the study of environmental concern; two distinct challenges are

presented here. The first relates to issues of conceptualization and the second to issues of measurement and interpretation. Jones (1998) suggests that the typical conceptualization of environmental concern might be too limited. If environmental concern is only addressing land management issues, environmental policy decisions about air and water, or conservation concerns about areas such as the Arctic National Wildlife Refuge, then it does not relate to those concerned with the built environment, like the sewage overflow in the cafeteria of Martin Luther King Junior High School in East Saint Louis in 1989 (Jones 1998; Kozol 1991). Furthermore, when researchers fail to distinguish between environmental concern and environmental activism it fails to capture those who may be concerned about the environment but may not be politically active regarding its causes (Jones 1998). These nuances in the conceptualization of environmental concern are crucial because they affect both the wording of survey questions and the interpretation of results, consequently affecting the overall quality of research.

In 1978 Dunlap and Van Liere published the new environmental paradigm (NEP) scale which allows for the use of survey data to measure the presence or absence of a new environmental mind-set, which they thought was increasingly influential at the time that the scale was introduced. The NEP represents a set of values ranging from a high value of environmental concern to an orientation toward the dominate social paradigm (DSP). The NEP espouses an understanding of growth limits and a commitment to environmental protection, as opposed to the DSP where scientific and technological advances are touted as the solutions for environmental problems (Dunlap, Van Liere, Mertig, and Jones 2000). Since 1978 the scale has been widely used, it has been both

replicated and modified. Most notable is the work of Dunlap, Van Liere, Mertig, and Jones (2000) that provided revisions to the scale. They changed the E in NEP from environmental to ecological, increased the Likert items used from 12 items to 15 items, and revised and updated the scale to represent more modern conceptualizations of environmentalism. The NEP scale is widely considered to be a valid measure of environmental attitudes, although concerns with its predictive validity have been expressed (Fransson and Garling 1999). Using a standardized measurement tool such as the NEP scale (which is not the only available measurement tool) reduces the problems associated with question wording; however, it does not eliminate problems with interpretation.

Other ways of measuring environmental concern involve secondary data analysis and the frequent use of the National Opinion Research Center's (NORC) General Social Survey (GSS; Jones and Dunlap 1992; Jones and Carter 1994; Jones 1998). A challenge to using GSS trend data is the limitation of single-item indicators; no two indicators measure a single concept in the same way, and no one indicator can be expected to measure an intended concept in its entirety (Jones and Dunlap 1992). The limitations of single-item indicators include reduced ability to generalize the results of the study. For example, the NORC spending item question assesses individual support for federal government spending on environmental protection, but a question assessing spending or concern at a local level might yield different results (Jones and Dunlap 1992). Furthermore, data involving the willingness to pay for protection (WTP) as a representation of environmental concern may minimize the complex dynamics between the environment and the economy (Kalof and Satterfield 2005). Last, it is crucial to note

that although many studies employ the strategies of Van Liere and Dunlap (1980) and Davidson and Freudenburg (1996) – to compare the results of multiple studies – there are methodological concerns for doing so (Dunlap and Jones 2002). The techniques used to conceptualize and measure environmental concern, along with the socio-political circumstance of value development, directly influence the researcher's ability to draw conclusions and generalize the results (Jones 1998).

Klineberg, McKeever, and Rothenbach (1998) report evidence to suggest that the framing of environmental issues (i.e. differences in the wording of survey questions) account for varied results regarding gender differences in environmental concern. It should be noted, however, that Klineberg, McKeever, and Rothenbach (1998) report "mixed" results for the effects of gender on measures of environmental concern, yet their findings on all five of their summary indices indicate that women select more pro-environment responses than men, and on a few of their single item indicator questions they found no differences between the environmental concern of men and women. They did not, however, find evidence to suggest that men display more concern for the environment than women. Although, I strongly agree that the framing of environmental issues (i.e. question wording) affects results, I also believe that testing for mediating and moderating effects can help explain varied results regarding complex gender differences in levels of environmental concern.

Combining Theory and Measurement in this Study

For the systematic review of literature section of this study, I grouped dependent variables by eight commonly used themes regarding the measurement of environmental concern. The typologies include (1) support for animal welfare, (2) support for

ecological paradigm, (3) support for the environment over the economy, (4) concerned about health and safety risks, (5) willingness to take personal action to help the environment, (6) support for environmental policy/legislation, (7) trust/belief in the environmental movement, and (8) willingness to pay to protect the environment. These categories were selected based on theories discussed earlier in this chapter; many of the typologies represent theoretical reasons frequently used to explain differences between men's and women's levels of environmental concern. In addition, I sorted four of the typologies (support for ecological paradigm, support for the environment over the economy, concerned about health and safety risks, and support for environmental policy/legislation) into one of two subcategories: global (or general) survey questions versus local (or specific) survey questions.

Questions that asked about concern for animals were placed in the support for animal welfare category. It should be noted that although measurers of concern were assigned only one typology, the categories themselves are not necessarily mutually exclusive. For example, the environmental concern measure from Leiserowitz's 2006 article, perceived seriousness of nature preservation, such as the loss of wildlife, could have been categorized as support for animal welfare instead of support for ecological paradigm. It was assigned the support for ecological paradigm typology, however, because it is a composite variable that includes a variety of survey items. Only questions asking solely about animal welfare were placed in the support for animal welfare category. Although the support for animal welfare typology does not represent a common theme among environmental concern scholars, I used it because it represents a common topic in the ecofeminist literature.

The support for ecological paradigm typology is based on the well established theories of Dunlap and Van Liere (1978) and Dunlap, Van Liere, Mertig, and Jones (2000). Although the survey items themselves are not necessarily directly from the new ecological paradigm (NEP) scale, they do represent a commitment to environmental protection as delineated by the NEP scale. For example, survey items assessing concerns about population growth and beliefs about the impact of human behavior on the environment were placed in the support for ecological paradigm typology. Survey items asking respondents to prioritize their environmental values in juxtaposition to their beliefs and concerns for economic wellbeing were placed in the support for the environment over the economy typology.

Measures of environmental concern placed in the support for ecological paradigm typology as well as the support for the environment over the economy category were also assigned one of two subcategories: global (or general) or local (or specific). A survey item was given the local (or specific) subcategory if, for example, it assessed preferences for natural resource jobs over natural resource conservation or if it assessed environmental concerns regarding economic development on a local level (e.g., urban sprawl in the respondent's community). This is contrasted to survey questions that asked respondents, for example, to determine to what extent they believe the economy should take precedent over the environment, such survey items were given the global (or generic) label.

The concerned about health and safety risks typology is drawn from the findings of Davidson and Freudenburg's (1996) study. The concerned about health and safety risks typology includes survey items that assessed respondents' concerns with

environmental problems causing health and safety risks. These survey items were also placed into one of the two subcategories, questions that assessed health and safety risks to the general population (assigned to the global/general subcategory) versus questions that assessed concerns for health and safety risks directly impacting the respondent, his or her family, or community and questions that assessed concerns for a specific type of health or safety risk (assigned to the local/specific category). The willingness to take personal action to help the environment typology included questions about respondents likelihood to buy green products, carpool, or participate in environmental organizations, for example.

The support for environmental legislation/policy typology included survey items regarding respondents' likelihood to vote for environment-specific legislation or respondents' agreement with the government's handling of environmental problems. The legislation/policy survey items were also assigned to the subcategories of global (or general) versus local (or specific) measures of environmental concern. The trust/belief in the environmental movement typology included survey items where respondents evaluated the effectiveness of environmental organizations, their favorability toward environmentalists, and/or their faith in the environmental movement. The willingness to pay to protect the environment typology involved survey items where respondents evaluated their willingness to spend money for environmental protection; this is often asked in the form of respondents' willingness to pay higher taxes.

CHAPTER FOUR

DATA AND METHODS

Systematic Review of Literature

Sample Selection

The first element of my analyses involves a systematic review of the environmental values literature. The articles selected for this section of my study was found using a three-step procedure. First, I searched the University of Tennessee libraries online database and online journal search engines, specifically JSTOR and Web of Science – Social Sciences Citation Index, using search terms such as *gender and environment*, *environmental concern*, and *environmental values*. I also searched these databases using the names of several prominent and current scholars in the field of environmental concern (e.g., Dietz, Dunlap, Hamilton, Jones, Kalof, McCright, and Mohai). Second, I browsed journals that frequently publish articles on the topic of environmental concern, these include: *Environment and Behavior*, *Environmental Values, Population and Environment*, *Public Opinion Quarterly*, *Risk Analysis*, *Rural Sociology*, and *Social Science Quarterly*. Third, I used a snowball sampling procedure where I reviewed the citation lists from several relevant articles. This last technique was extremely useful, especially when focused on five articles that directly address the relationship between gender and environmental concern (Blocker and Eckberg 1997; Bord and O'Connor 1997; Finucane, Slovic, Mertz, Flynn, and Satterfield 2000; Kalof, Dietz, and Guagnano 2002; Marshall 2004).

Next, I reviewed each article to determine if it qualified for the study. In order to be included in the sample an article needed to (1) assess gender differences (or lack of differences) in levels of environmental concern, (2) contain original research published in a peer reviewed journal between 1995 and 2010, (3) include quantitative data analysis and results, and (4) include a sample specific to the United States. Based on this criterion, books, chapters in edited books, dissertations, and reports published for government, non-profit, or research institutes were excluded. In addition, some studies were not able to be used because I could not extract the gender-specific data, these studies typically did not have the relationship between gender and environmental concern as their primary focus. In one case, the authors reported controlling for gender in their models but did not provide the statistical findings associated with these controls (Jones, Fly, Talley, and Cordell 2003). In another case, the authors provided regression coefficients with significance for gender as a control variable but did not provide their coding or discussion of their findings, making it impossible to determine whether the relationship was stronger for men or for women (Krosnick, Holbrook, Lowe, and Visser 2006).

Coding and Analysis

Once articles were identified for inclusion, I extracted general information about each study including publication information (journal and date), dataset used, sample size, geographic location of sampling base (national, regional, or local), and the analytic techniques used (e.g., linear regression or structural equation modeling). When possible, I then classified the sampling base as rural or urban. A majority of studies (16) were either unable to be classified or sampled from both rural and urban areas.

Next, I recorded the results regarding gender and environmental concern. I documented the details of the dependent variables for each model; when possible I collected the exact question wording for the measure of environmental concern used. If results were significant, I determined the direction of the relationship; did women express more environmental concern than men or did women express lower levels of concern for the environment than men? I also noted if the dependent variable was scaled or if it was a single item indicator.

After all the data were recorded I sorted each of the 128 measures of environmental concern from the 22 articles examined into three categories according to the results: measures of association that did not indicate any difference between men's and women's level of environmental concern, measures of association that indicated that women expressed greater levels of concern for the environment than men, and measures of association that indicated that women expressed a lower level of concern for the environment than men. I then looked for similarities and differences among and between the three categories. Next, I placed each of the 128 dependent variables into one of eight typologies[7] based on the type of environmental concern being measured. The typologies include (1) support for animal welfare, (2) support for ecological paradigm, (3) support for the environment over the economy, (4) concerned about health and safety risks, (5) willingness to take personal action to help the environment, (6) support for environmental policy/legislation, (7) trust/belief in the environmental movement, and (8) willingness to pay to protect the environment. These categories were selected based on theory (as discussed in Chapter Three); many of the typologies

[7] See Table A.1 in the Appendix for the specific typology of each of the 128 survey items.

represent theoretical reasons frequently used to explain differences between men's and women's levels of environmental concern. Within four of the categories (support for ecological paradigm, support for the environment over the economy, concerned about health and safety risks, and support for environmental policy/legislation) the survey items were placed into one of two subcategories: global (or general) survey questions versus local (or specific) survey questions.

Once each of the 128 measures of environmental concern were placed into one of the eight typologies, I again sorted by the three possible outcomes: (1) there is no significant difference between men's and women's levels of environmental concern, (2) women express greater concern for the environment than men, and (3) women express lower levels of concern for the environment than men. I then looked for patterns within each of the eight typologies and within the global (or generic) versus local (or specific) subcategories. Results for the systematic review of literature are presented in Chapter Five.

Mediating and Moderating Effects

Data

The data used to answer research questions three, four, and five are taken from the General Social Survey (GSS) Environment II: 2000 questionnaire and the American National Election Study (ANES) 2008 Time Series Pre-election Survey. The GSS is a dataset commonly used by environmental values scholars and was selected primarily for this reason. The GSS is a nationally-based survey assessing the behaviors, attitudes, and demographic characteristics of the American population. The GSS is

conducted using face-to-face interviews. The ANES is less commonly used by environmental sociologists; however, it does ask respondents a series of questions about their environmental values. The ANES is a nationally-based telephone sample survey of registered voters. It is used to assess voting behavior as well as to collect public opinion data. It is helpful to use a variety of data sources to assess the consistency and reliability of results across multiple survey items. Since there are numerous ways by which environmental concern can be measured, there are a total of 31 potential dependent variables across the two datasets representing various measures of environmental concern[8].

Dependent Variables

Factor Analysis

As discussed in the previous chapter, multiple indicator measures are the best way to assess public opinion; however, since I did not choose the indicators, I have to take a post hoc approach to creating multiple indicators. To do so, I conducted principle component analysis (PCA), a type of exploratory factor analysis, to determine whether and which environmental concern indicators are measuring the same underlining construct (factor) and need to be scaled together (Hamilton 2006). Using Stata/SE 9.2 I obtained six initial factors with eigenvalues greater than one for 28 measures of environmental concern from the GSS. I then extracted the six factors (or principle components) principal factoring with iterated communalities (Hamilton 2006). I rotated the factors using a promax oblique (non-orthogonal) rotation. Promax is a type of rotation used to simplify the factor structure so that the results can be more easily

[8] Variables with more than 15 percent missing data were not considered for inclusion in the study.

interpreted in three-dimensional space (Hamilton 2006). Based on the results of the rotation, I determined the factor that each variable loaded the highest on. If a factor had at least three variables loading high on it then I tested the inter-item reliability (*alpha*) that resulted from scaling those variables together. Three factors produced alphas of .7 or higher. See Table 4.1 for the results of the rotated factor loading and alpha reliability scores.

Based on the results of the PCA, I created three composite variables that combined 15 of the 28 dependent variables leaving me with the possibility of 13 single item indicator variables. The three scaled variables represent (1) respondents' *willingness to pay* to protect the environment, (2) the extent to which respondents' believe that *environmental problems are dangerous*, and (3) respondents willingness to be pro-environment given the *opportunity cost* or tradeoffs involved. *Willingness to pay* is a combination of three variables (Factor 3 see Table 4.1), *environmental problems are dangerous* is a scale combining five variables (Factor 2), and *opportunity cost* combines seven single item indicators into a scaled variable (Factor 1). After creating the three composite variables, I multiplied *willingness to pay* and *environmental problems are dangerous* by negative one to change the direction of the coding so that higher values indicated greater concern for the environment.

Table 4.1 Rotated Factor Loading and Alpha Reliability Results for Principle Component Analysis

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
Reliance on science	.172	-.116	.085	-.093	.174	.252	.845
Environment versus jobs	.527	.035	-.238	.003	.130	.304	.448
Modern life harms environment	-.069	.052	-.149	.046	.597	.062	.634
Worry too much about human progress harming environment	.491	-.037	-.108	-.054	.044	.367	.469
Economic growth protects environment	.195	.033	-.043	-.004	-.028	.386	.790
Growth harms environment	.056	-.106	.028	-.071	.621	.015	.664
Willingness to pay higher prices to protect environment	-.039	.018	.783	.010	-.031	.040	.350
Willingness to pay higher taxes to protect environment	.002	-.039	.836	.003	-.046	-.071	.341
Willingness to accept cuts in standard of living to protect environment	-.105	-.014	.652	.029	-.005	-.020	.488
Too difficult for me to help environment	.518	.004	.112	-.157	.256	-.057	.627
Taken part in environmental protest	-.057	-.048	-.118	.303	.153	-.082	.886
Concerned about population growth	-.105	.065	.023	.000	.374	.000	.799
More important things than helping environment	.750	.013	.024	.106	-.156	-.109	.502
No point in me helping environment unless others do too	.700	.045	.049	-.019	.145	-.099	.532
Environmental problems are exaggerated	.584	-.129	-.037	.050	-.184	.184	.456
America is helping environment too much, too little, right amount	.435	-.053	-.038	-.018	-.245	.159	.623
Economic progress dependent on health of environment	.007	.076	.208	.015	.260	.191	.782
Likelihood of damage from nuclear accident	.175	.222	-.014	.150	.358	-.032	.718
I help environment	-.069	.023	.191	.151	-.002	.228	.840
Car pollution is dangerous	-.013	.743	.008	.005	-.066	.043	.487
Industry pollution is dangerous	.025	.891	-.100	-.030	-.037	-.040	.328
Pesticides and chemicals in farming are dangerous	.069	.658	.071	-.011	-.009	.029	.565
Water pollution is dangerous	-.034	.620	.062	.012	-.048	.013	.586
Global warming is dangerous	-.104	.554	.064	-.041	.115	.006	.529
I recycle	-.064	.007	.074	.265	-.069	.105	.877
Membership in environmental organization	.090	-.037	.048	.474	.058	-.002	.795
Signed petition to help environment	-.094	.012	-.041	.574	.005	-.028	.618
Given money to environmental organization	.027	-.033	.066	.690	-.020	-.001	.519
Alpha Coefficient*	**.791**	**.801**	**.833**	.392	.583	.446	

*Alpha coefficients represent the alpha reliability score for combining measures loading high (highlighted in gray) for each particular factor

Single Item Indicators

Of the remaining 13 single item indicator variables from the GSS, I used eight for this study. Items were not used if there were less than 100 respondents in any given cell or category. For example, the survey question asking respondents if they have participated in an environmental protest or demonstration in the last five years yielded only 37 respondents who reported taking part in a protest or demonstration out of the 1,160 respondents who answered the question. Thus, this variable was not used. In addition, the variable asking respondents if they have given money to an environmental group in the last five years was not used because the GSS codebook advises researchers to use this variable with caution, as the "yes" responses are overestimated.

The exact question wordings of the eight GSS single item indicators used in this study are as follows:

- *Reliance on science:*

  How much do you agree or disagree with each of these statements? **Modern science will solve our environmental problems with little change to our way of life.** Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

- *Modern life harms the environment:*

  Please check one box for each of these statements to show how much you agree or disagree with it. **Almost everything we do in modern life harms the environment.** Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

- *Economic growth protects the environment:*

How much do you agree or disagree with each of the following statements. **In order to protect the environment, America needs economic growth.** Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

- *Growth harms the environment:*

  How much do you agree or disagree with each of the following statements. **Economic growth always harms the environment.** Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

- *Concerned about population growth:*

  Please circle one number for each of these statements to show how much you agree or disagree with it. **The earth cannot continue to support population growth at its present rate**. Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

- *Progress is dependent on the health of environment:*

  How much do you agree or disagree with each of these statements? **Economic progress in America will slow down unless we look after the environment better.** Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

- *Likelihood of damage from a nuclear accident:*

  Within the next five years, **how likely is it that an accident at a nuclear power station will cause long-term environmental damage across many countries?** Very likely, likely, unlikely, very unlikely, can't choose, don't know, not applicable.

- *I help the environment:*

  How much do you agree or disagree with each of these statements? **I do what is right for the environment, even when it costs more money or takes up more time.** Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree.

Seven of the eight variables (*reliance on science, modern life harms the environment, economic growth protects the environment, growth harms the environment, concerned about population growth, progress is dependent on the heath of environment, and I help the environment*) were recoded to collapse the strongly agree and agree responses together and the strongly disagree and disagree responses together, due to small response sizes for some of the values. The neither agree nor disagree response was kept as its own category. The *likelihood of damage from a nuclear accident* variable was recoded to collapse the very likely and likely responses together and the very unlikely and unlikely responses together. The "can't choose," don't know," and "not applicable responses" were coded as missing data. Five of the eight variables (*modern life harms the environment, growth harms the environment, concerned about population growth, progress is dependent on the health of environment,* and *I help the environment*) were reverse coded so that a higher value reflects greater concern for the environment or a more pro-environment paradigm. The *likelihood of damage from a nuclear accident* dichotomous variable was coded as a dummy variable where one represents a respondents' belief that wide-spread and long-term damage from a nuclear accident is probable and zero represents a respondents' belief that damage from a

nuclear accident is not likely to happen. In sum, all indicators used in my research are coded or reverse coded so that greater values indicate greater environmental concern.

The exact question wordings of the three ANES single item indicators used in this study are as follows:

- *Feelings toward environmentalists:*

  I'd like to get your feelings toward some of our political leaders and other people who are in the news these days. I'll read the name of a person and I'd like you to rate that person using something we call the feeling thermometer. Ratings between 50 degrees and 100 degrees mean that you feel favorable and warm toward the person. Ratings between 0 degrees and 50 degrees mean that you don't feel favorable toward the person and that you don't care too much for that person. You would rate the person at the 50 degree mark if you don't feel particularly warm or cold toward the person. If we come to a person whose name you don't recognize, you don't need to rate that person. Just tell me and we'll move on to the next one. **How would you rate: Environmentalists?**

- *Lower power plant emissions:*

  We'd like to ask whether you favor, oppose, or neither favor nor oppose a series of ways that the federal government might try to reduce future global warming. **Power plants put gases into the air that could cause global warming. Do you favor, oppose, or neither favor nor oppose the federal government lowering the amount of these gases that power plants are allowed to put into the air?**

- *Support for gas tax:*

  Do you favor, oppose, or neither favor nor oppose increasing taxes on gasoline so people either drive less or buy cars that use less gas?

The *feelings toward environmentalists* variable is an interval measure that is not skewed, so it did not require any transformation. The *lower power plant emissions* and *support for gas tax* variables were reverse coded so that a higher number reflects greater support for environmental protection. All dependent variables from both datasets, including the scaled variables, were coded so that the higher the number the more pro-environment the response.

Independent Variables

For the GSS dataset 11 independent variables were used to measure gender, age, race, class, education, political party identification, place of residence, marital status, number of children, religious identification, and knowledge about science. For the ANES dataset nine independent variables were used to measure gender, age, race, class, education, political party preference, place of residence, marital status, and religious identification. Measures for number of children and knowledge about science were not available in the ANES dataset. The variable of interest for this study is gender. Gender was coded as a dummy variable in both datasets where 1 equals male and 0 equals female.

Age is an interval measure in both datasets and did not require recoding. Race was collapsed and coded as indicator (dummy) variables in both datasets where 1 equals white and 0 equals non-white. Although it is problematic to discuss race dichotomously, all independent variables in this study either remained at the interval

level of measurement or were collapsed to dichotomous variables to simplify the interpretation of interaction terms and to keep value sizes robust. In the GSS dataset class was dichotomized as lower class (coded as 1) and non-lower class (a combination of middle and upper class categories and coded as 0). In the ANES dataset the lower class and working class categories were collapsed together and coded as 1 and the middle and upper class categories were collapsed together and coded as 0. In the GSS dataset education is measured as years of education ranging from 0 to 20. In the ANES dataset education is measured as educational attainment and grouped into seven categories by completion of grades and/or degrees: grades zero through eight (coded as 1), grades nine through 12/ no diploma or equivalency (coded as 2), high school diploma or equivalency (coded as 3), 13 plus grades/no degree (coded as 4), junior or community college degree (coded as 5), bachelor of arts/science degree (coded as 6), and advanced degree (coded as 7). This original coding was kept and the educational attainment variable, as an ordinal level of measurement, was treated as an interval level of measurement during the data analysis because its distribution warrants it. It is obviously problematic to discuss those with no education in the same category as those with greater than a primary education; however, the ANES did not report the nuances of the zero through eighth grade category. Additionally, fewer than 1.5 percent of US adults have never attended school (US Census 2000).

In the GSS dataset political party identification was recoded as Republican (coded as 1) and not Republican, which included Democrats, independents, and those belonging to other political parties (coded as 0). For the ANES dataset the Republican thermometer variable was used to measure respondents' feelings toward the

Republican Party. The variable asked respondents to rate on a scale of 0 (not favorable) to 100 (very favorable) their feelings toward the Republican Party. In both the GSS and ANES datasets place of residence was coded as a dummy variable with urban and suburban places of residence collapsed together and coded as 1 to represent those residing in an urban setting and small towns, country village, and farm/country home responses were collapsed together and coded as 0 to represent those residing in a non-urban setting.

Marital status in the GSS and ANES datasets was coded as indicator variables with ever married coded as 1 and including responses of currently married, widowed, divorced, and separated and never married coded as 0. In the GSS dataset, number of children is an interval level of measurement ranging from 0 to 8 (which was top-coded). The number of children of the respondent was not available in the ANES dataset, only a measure of number of children living in the household, and thus number of children was not used in the data analysis using the ANES dataset. For both the GSS and ANES datasets religious identification was collapsed to religiously affiliated (coded as 1) which included responses of Protestant, Catholic, Jewish, and other and not religiously affiliated (coded as 0). Scientific knowledge was measured in the GSS dataset as respondents' belief in evolution. Respondents were asked to rate the statement "humans came from animals" as definitely true, probably true, probably not true, and definitely not true. The belief in evolution variable was coded as a dummy variable where definitely true and probably true were collapsed together and coded as one and definitely not true and probably not true were collapsed together and coded as zero. It is problematic to measure scientific literacy with a variable asking respondents about

their belief in evolution; however, respondents' belief in evolution does reflect a respondents' orientation toward scientific knowledge. Scientific knowledge is not able to be measured in the ANES dataset.

Regression Diagnostics

Prior to running my models, I ran regression diagnostic tests to thoroughly check that the data I used fit the Gauss-Markov Assumptions: random distribution, normal distribution, linearity, homoskedasticity, and independence. Of the 14 full models I used (representing 14 different dependent variables from the two datasets), four models were tested using linear regression techniques (*willingness to pay, environmental problems are dangerous, opportunity cost, and feelings toward environmentalists*). The other ten models were tested using non-parametric techniques, either ordered logistic regression or logistic regression depending on the appropriate analysis for the level of measurement of the dependent variable. Variables with a high percentage of missing data were not used in any of the models. The variables demonstrated no problems with influence and did not violate assumptions of linearity (this is likely because many of the independent variables were coded as dummy variables). For the four linear regression models, I tested for errors related to problems with heteroskedasticity using the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. The p-value associated with the chi-square test for heteroskedasticity in three of the models (*willingness to pay, environmental problems are dangerous, and opportunity cost*) was greater than .05 allowing me to fail to reject the null hypothesis and indicating that the error terms in my models were identically distributed.

In the ANES dataset, however, the probability for the chi-square for the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity for the *feelings toward environmentalists* model was less than .001 indicating problems with heteroskedasticity. The problem with heteroskedasticity in this model likely arises from data heaping caused by digit preference. Respondents were asked to rate environmentalists on a scale of 0 to 100, and respondents were more likely to choose numbers such as 60, 70, and 85 than they were 6 or 89, for example[9]. To fix this I conducted robust regression analyses for all models involving the *feelings toward environmentalists* dependent variable. Using robust regression adjusts the standard errors for inflation caused by heteroskedasticity, using a Huber-White estimator.

Models were also tested for multicolinearity. The variance inflation factor (VIF) score for all independent variables in all models was less than 10 and the tolerance test (1/VIF) was greater than .1 for all variables in all models. This indicates that the predictors in my models were not correlated to a degree that would artificially inflate the error terms.

Methodology

Model Building

In order to test for mediated effects, I use a nested model building technique. Model building is frequently used for the purpose of indentifying potential mediating and moderating effects. First I ran bivariate analyses using OLS regression (for the *willingness to pay, environmental problems are dangerous,* and *opportunity cost*

[9] See Table A.2 in the Appendix for a distribution of data that illustrates digit preference for *feelings toward environmentalists* variable.

models), robust regression (for the *feelings toward environmentalists* model), ordered logistic regression (for the *reliance on science, modern life harms the environment, economic growth protects the environment, growth harms the environment, concerned about population growth, progress dependent on the health of the environment, I help the environment, lower power plant emissions,* and *support for gas tax* models), and logistic regression (for the *likelihood of damage from nuclear accident* model) as appropriate. I looked at the coefficients associated with the 14 measures of environmental concern and gender individually as well as between each dependent variable and each potential mediator variable (age, race, class, education, political party identification, place of residence, marital status, number of children, religious identification, and belief in science).

Next I ran two multivariate models (a reduced model and a full model) for each of the 14 dependent variables. The reduced model for the GSS and the ANES datasets included gender and controls for age, race, class, education, political party identification, and place of residence. These socio-demographic characteristics as predictors of environmental concern have been well tested and discussed in the literature throughout the past three decades. For the full models using the GSS dataset I added controls for marital status, number of children, religious identification, and belief in science to the reduced model. The relationship between these socio-demographic characteristics and levels of environmental concern are not as well established or tested in the literature as the socio-demographic characteristics in the reduced models. In the ANES dataset I added controls for marital status and religious identification. Number of children and belief in science were not measured in the ANES dataset.

Once I had acquired coefficients for the three model types, I looked at the coefficients for gender and the level of significance across the models to see if there were any changes in the outcome between gender and each dependent variable. I was specifically looking for any models where gender was significant in the bivariate or other reduced models but as control variables were added gender became non-significant, indicating the presence of a mediated relationship between gender and one or more socio-demographic characteristic[10]. This occurred in three measures of environmental concern (*willingness to pay, growth harms the environment,* and *progress is dependent on the health of environment*). For each of these measures of environmental concern I went back and added socio-demographic characteristic one at a time to the bivariate model to determine which socio-demographic variables were operating as intervening variables between gender and the particular measure of environmental concern. Identifying the relationship between gender and any intervening socio-demographic characteristic on levels of environmental concern can help to explain gender differences with regard to environmental paradigms because gender might be operating through other socio-demographic characteristics.

Testing for Interactions

In addition to looking for mediating effects through a model building technique, I also looked for moderating effects across models. If the regression coefficient or level of significance associated with the relationship between gender and environmental

[10] The absence of a significant coefficient in the presence of controls can also indicate spuriousness. Determining which effects are spurious and which are indirect (i.e., fully mediated) is a matter of theory. Since the variable choices used in this research were theoretically based. I maintain that reductions in coefficient sizes and significance levels are due to mediation.

concern increases across models, or if the coefficient changes signs, then there is likely the presence of a moderating relationship between gender and other socio-demographic characteristics on measures of environmental concern[11].

In order to test for interaction effects, interaction terms were created between gender and each of the other socio-demographic measures. There are six independent variables (in the GSS and ANES dataset combined) measured at an interval level (in the GSS age, education, and number of children are interval levels of measurement and in the ANES age, education, and warmness toward the Republican Party are interval levels of measurement). I first centered each of these variables and then multiplied the centered variable times gender to create six different interaction terms.

For the 11 remaining dummy predictors in the GSS and ANES dataset I created an interaction term for each possible category. For example, I created a variable for being a man and white, one for being a man and non-white, one for being a woman and white, and one for being a woman and non-white. I then selected a reference category (in the example here, white men). Then I ran 134 interaction models: one for each measure of environmental concern with each interaction term. If I found significance for an interaction term involving an interval level of measurement I then graphed the interaction in order to more easily interpret the results.

Overall I ran 343 models to test for mediating and moderating effects of gender and various socio-demographic characteristics on 14 different measures of environmental concern. These models included bivariate, other reduced, and full (non-

[11] There are many reasons that one might test for moderating effects, but this particular inspection technique seems most appropriate for the models used here.

moderated) models as well as full models with interaction terms. Results including tables and graphs can be found in Chapter Six for mediating effects, Chapter Seven for moderating effects, and the Appendix for supplemental results.

CHAPTER FIVE

A SYSTEMATIC REVIEW OF GENDER AND ENVIRONMENTAL CONCERN IN QUANTITATIVE LITERATURE

My study builds on the work of Davidson and Freudenburg (1996) that made major contributions to the area of gender and environmental values by providing a systematic compilation of previous research. The purpose of their study was twofold. First, they synthesized accumulated research findings focused on the effects of gender on measures of environmental concern and drew conclusions about patterns of results. Second, they tested five hypothesis regarding explanations for the differences between the levels of environmental concern of men and women. Those hypotheses were (1) knowledgeable support hypothesis, (2) institutional trust hypothesis, (3) economic salience hypothesis, (4) safety concerns hypothesis, and (5) parental roles hypothesis. In this chapter, I provide an update to Davidson and Freudenburg's (1996) seminal study. Specifically, I explore the findings of work published in the sixteen years since their work was concluded.

By providing an updated, systematic review of previous literature on gender and measures of environmental concern I can offer a more modern, and, hopefully, more nuanced perspective on the differences and similarities between and among studies regarding the effects of gender on a variety of measures of environmental concern. Like Davidson and Freudenburg (1996), I am concerned with whether or not there are any patterns that emerge to help explain variations in findings across studies. Specifically, I am interested in similarities and differences in geographical region, type of variables and datasets used, question wording, survey design, and other factors. Are

there common characteristics among studies that find that women express a greater concern for the environment than men? What, if any, implications can be drawn from these patterns or lack of patterns?

Although I do not test explicitly stated hypotheses regarding an expectation of findings, there are several patterns that I am looking for based on current theoretical explanations regarding gender differences in levels of environmental concern. First, Davidson and Freudenburg (1996) found consistent support for the *health and safety* hypothesis, that women tend to express greater concern for the environment than men when issues are framed as a risk to health and safety (also see Blocker and Eckberg 1989, 1997; Bord and O'Connor 1997; Marshall 2004; Mohai 1992, 1997; O'Connor, Bord, Yarnal, and Wiefek 2002).

Second, women tend to express greater concern for the environment than men when issues and solutions are framed as *local versus global* (Blocker and Eckberg 1989; Mohai 1992, 1997). For example, O'Connor, Board, and Fisher (1999) conclude that women are more likely than men to report participating in voluntary actions to reduce environmental damage (e.g. carpool to work) but less likely than men to report willingness to vote for specific legislation aimed at reducing environmental damage. O'Conner and his colleagues (1999) theorize that perhaps men are more comfortable in the political realm while women are more comfortable with personal and local approaches to help solve environmental problems.

Third, some researchers (Hamilton 2008; Zelezny, Chua, and Aldrich 2000) have suggested that women tend to express greater concern for the environment than men because women have a greater *ethics of caring*. Zelezny, Chua, and Aldrich (2000) find

that women report a greater sense of personal responsibility to improve environmental conditions than do men. This finding is consistent across people of different ages in 14 countries. They suggest that these differences are due to the tendency of women to be socialized to be responsible to the community at large. Furthermore, Hamilton (2008), studying concern for the local environment in Antartica finds that:

> On certain environmental issues, women tend to express higher levels of concern. Three of our polar issues follow that pattern: concern about Inuit losing their traditional way of life, polar bears becoming extinct, or Arctic seals being threatened. Regarding the less compassionate topics of sea level, ice melt, or Antarctica, we see no significant gender effects (p. 676).

Thus, Hamilton (2008) suggests that the differences in gender effects are essentially accounted for by questions that elicit an emotional (or caring) response versus survey items that do not because topic and/or the question wording is more detached[12].

Fourth, although not directly in the environmental concern literature, I am curious to see if women express a greater concern for the environment when questions are specifically addressing *animal welfare*. Much has been written in feminist literature connecting the plight of women to the plight of animals, and many eco-feminists have called for women to become vegetarians (see Adams 1990, 2003; Adams and Donovan

[12] Debates about ethical and moral differences between men and women have been prolific among feminist and psychologists since the publishing of Gilligan's (1982) controversial book *In a Different Voice*. Although research has found that women are more likely than men to express concern, compassion, and responsibility for the well-being of others (Beutel and Marini 1995), it is not without controversy. Many feminist scholars claim that these differences are not intrinsic and suggest that emotional differences between men and women have been used as a justification to exclude women from various activities (i.e. industries that claim to require a certain amount of emotional stability such business, government, and management positions; Kimmel 2011). Furthermore, the ways in which moral and ethical differences between men and women affect environmental values is, at this point, largely speculative.

1995; Merchant 1980; Mies and Shiva 1993; Shiva 1989; Warren 2000). Overall, in my systematic review of the most recent environmental concerns literature, I explore these four themes as well as new themes that might emerge, but have not yet been previously discussed by other scholars.

The literature selected for this review was found by searching the University of Tennessee libraries online database and online journal search engines, as well as a snowball sampling procedure (i.e. reviewing the citation lists from relevant articles). In order to qualify for this study an article needed to (1) assess gender differences (or lack of differences) in levels of environmental concern, (2) contain original research published in a peer reviewed journal between 1995 and 2010, (3) include quantitative data analysis and results, and (4) include a sample specific to the United States.

Results

Environmental Concern Literature: 1995-2010

Twenty-two studies that collectively accounted for 128 measures of environmental concern were included in this systematic review. The 22 articles were published between 1995 and 2010 in 15 different peer reviewed journals. Thirteen articles were nationally focused (one of which focused only on the 48 contiguous states) and nine articles had a regional or local (city, county, or state) sampling base. Two studies were urban-centered, four studies were rural-specific (one claiming to be "mostly rural"), and 16 studies either did not specify or sampled residents from both rural and urban areas. Four studies used data from the General Social Survey (years 1993 and 2006), two studies used data from the Gallup Poll (years 2000 and 2000-

2006), and 16 studies used data that the researcher(s) or an institution associated with the researcher(s) collected (10 surveys were conducted over the phone, five by mail, and one face to face). Almost all researchers who wrote and/or conducted their own surveys referenced one or more of Dillman's various works as a source for their survey methods. Sample sizes ranged from 150 to 7,842. Analytic techniques in the 22 studies included difference of proportions, linear regression, ordered logistic regression, logistic regression, Pearson's correlation, structural equation modeling (SEM), analysis of variance (ANOVA), and multivariate analysis of variance (MANOVA).

The systematic review I offer here is qualitative (categorical) in nature instead of quantitative (i.e. a meta-analysis) because the wide variety of analytic techniques used by researchers makes reliable statistical comparison of the studies impossible. Despite my inability to conduct a formal meta-analysis, however, clear patterns emerged. Of the 128 measures of environmental concern, 67 survey items found women expressed a greater concern for the environment than men (52.3 percent of the sample), two items found that women expressed a lower level of concern for the environment than men (1.6 percent of the sample), and 59 survey items found no significant difference between men's and women's levels of environmental concern (46.1 percent of the sample). Tables 5.1a through 5.1f present the results of the systematic review regarding varying levels of environmental concern between men and women[13].

[13] Question wording as reported by authors is preserved as much as possible in Tables 4.1a through 4.1f.

Table 5.1a Systematic Review of Literature: Levels of Environmental Concern Between Men and Women

Source	Measure of Environmental Concern	Scaled Variable	Support
Blocker and Eckberg 1997	Engages in personal green activities (bivariate)	Yes	O
	Engages in personal green activities (multivariate)	Yes	+
	Participates in organized green activities (bivariate)	Yes	O
	Participates in organized green activities (multivariate)	Yes	O
	Have a green lifestyle (bivariate)	Yes	+
	Have a green lifestyle (multivariate)	Yes	+
	Is willing to bear costs to protect the environment (bivariate)	Yes	O
	Is willing to bear costs to protect the environment (multivariate)	Yes	O
	Approves of government regulation to protect the environment (bivariate)	Yes	O
	Approves of government regulation to protect the environment (multivariate)	Yes	O
	Believes human actions (scientific/economic) hurt nature (bivariate)	Yes	+
	Believes human actions (scientific/economic) hurt nature (multivariate)	Yes	O
	Believes economy takes precedence over the environment (bivariate)	Yes	O
	Believes economy takes precedence over the environment (multivariate)	Yes	+
	Worries about effects of pollution (bivariate)	Yes	+
	Worries about effects of pollution (multivariate)	Yes	+
	Believes in animal rights (bivariate)	Yes	+
	Believes in animal rights (multivariate)	Yes	+
	Considers nature to be sacred (bivariate)	Yes	+
	Considers nature to be sacred (multivariate)	Yes	O

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Table 5.1b Systematic Review of Literature: Levels of Environmental Concern Between Men and Women

Source	Measure of Environmental Concern	Scaled Variable	Support
Bord and O'Connor 1997	Global warming as a health risk		+
	Global warming as an ecological risk		+
	Seriousness of global warming as problem (reduced model)		+
	Seriousness of global warming as problem (full model)		O
	Likeliness to take voluntary action to address global warming (reduced model)		+
	Likeliness to take voluntary action to address global warming (full model)		O
	Hazardous waste sites as a health risk		+
	Hazardous waste sites as an ecological risk		+
	Seriousness of hazardous waste sites as problem (reduced model)		+
	Seriousness of hazardous waste sites as problem (full model)		O
	Likeliness to take voluntary action to address hazardous waste sites (reduced model)		+
	Likeliness to take voluntary action to address hazardous waste sites (full model)		+
Boyd 1999	Willingness to spend money for environment	Yes	O
	How dangerous are environmental hazards	Yes	+
	Participate in green behaviors	Yes	+
Brody, Zahran, Vedlitz, and Grover 2008	Awareness/ perception of climate change risk	Yes	+
Dietz, Dan, and Shwom 2007	Support for environmental policies	Yes	O
	New Ecological Paradigm	Yes	O
	Trust in environmentalists	Yes	+

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Table 5.1c Systematic Review of Literature: Levels of Environmental Concern Between Men and Women

Source	Measure of Environmental Concern	Scaled Variable	Support
Dunlap, Xiao, and McCright 2001	Perceived impact of the environmental movement		O
	View of goals of the environmental movement		+
	Relationship w/ the environmental movement		+
	Membership in environmental organization		O
	Evaluation of environmental movement		+
	Trust in national environmental organizations		+
	Trust in local environmental organizations		+
	Self-identify as environmentalist		O
	Support for environment	Yes	+
Finucane, Slovic, Mertz, Flynn, and Satterfield 2000	Perceived risk from nuclear power plants		+
	Perceived risk from stored nuclear waste		+
	Perceived risk from lead in dust or paint		+
	Perceived risk from natural disasters		+
	Perceived risk from coal/ oil burning power plants		+
	Perceived risk from pesticides		+
	Perceived risk from hormones/antibiotics in meat		+
	Perceived risk from pesticides in food		+
	Perceived risk from crops genetically engineered		+
Guagnano and Markee 1995	Trust business/politicians to protect environment	Yes	O
	Responsibility to fix environment is w/ business & government - not me	Yes	O
Hamilton 2008	Concern for Inuit losing their traditional way of life		+
	Concern for polar bears becoming extinct		+
	Concern for Arctic seals being threatened		+
	Concern for sea level rising		O
	Concern for northern ice cap melting		O
	Concern for preserving Antarctica		O

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Table 5.1d Systematic Review of Literature: Levels of Environmental Concern Between Men and Women

Source	Measure of Environmental Concern	Scaled Variable	Support
Hamilton 2010	Global warming poses serious threat in lifetime (New Hampshire residents)		+
	Global warming poses serious threat in lifetime (Michigan residents)		+
Hamilton, Colocousis, and Duncan 2010	Has urban sprawl or rapid development had effect on your family/community?		O
	Use natural resources to create jobs or conserve natural resources for future generations?		+
	Effect of environmental rules that restrict development on your community		O
Hamilton and Keim 2009	How are local climate-change effects perceived	Yes	+
Kalof, Dietz, and Guagnano 2002	Environmental beliefs - based on NEP model	Yes	+
Klineberg, McKeever, and Rothenbach 1998	Economy vs. environment tradeoffs	Yes	+
	Concern for local pollution	Yes	+
	Concern for state-wide pollution	Yes	+
	Participate in pro-environment behaviors	Yes	+
	Ecological worldview	Yes	+
Leiserowitz 2006	Global warming risk perception (reduced model)		+
	Global warming risk perception (full model)		+
	Support policies to address global warming (reduced model)		+
	Support policies to address global warming (full model)		–
	Support higher taxes to address climate change (reduced model)		+
	Support higher taxes to address climate change (full model)		O

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Table 5.1e Systematic Review of Literature: Levels of Environmental Concern Between Men and Women

Source	Measure of Environmental Concern	Scaled Variable	Support
Marshall 2004	Perceived seriousness of water pollution (no industrial plant in community)		O
	Perceived seriousness of air pollution (no industrial plant in community)		O
	Perceived seriousness of hazardous waste disposal (no industrial plant in community)		O
	Perceived seriousness of illness from industry (no industrial plant in community)		O
	Perceived seriousness of industry being too close (no industrial plant in community)		O
	Perceived seriousness of odors from industry (no industrial plant in community)		O
	Perceived seriousness of toxic chemical leaks (no industrial plant in community)		O
	Perceived seriousness of pollution from waste (no industrial plant in community)		O
	Perceived seriousness of plumes of smoke (no industrial plant in community)		O
	Perceived seriousness of flames from stacks (no industrial plant in community)		O
	Perceived seriousness of noise from industry (no industrial plant in community)		O
	Perceived seriousness of water pollution (industrial plant in community)		O
	Perceived seriousness of air pollution (industrial plant in community)		+
	Perceived seriousness of hazardous waste disposal (industrial plant in community)		O
	Perceived seriousness of illness from industry (industrial plant in community)		+
	Perceived seriousness of industry being too close (industrial plant in community)		+
	Perceived seriousness of odors from industry (industrial plant in community)		+
	Perceived seriousness of toxic chemical leaks (industrial plant in community)		O
	Perceived seriousness of pollution from waste (industrial plant in community)		O
	Perceived seriousness of plumes of smoke (industrial plant in community)		O
	Perceived seriousness of flames from stacks (industrial plant in community)		O
	Perceived seriousness of noise from industry (industrial plant in community)		O
McCright and Dunlap 2008	Extent you worry about environmental problems	Yes	O

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Table 5.1f Systematic Review of Literature: Levels of Environmental Concern Between Men and Women

Source	Measure of Environmental Concern	Scaled Variable	Support
Mohai and Bryant 1998	Perceived seriousness of pollution (bivariate)	Yes	+
	Perceived seriousness of pollution (multivariate)	Yes	+
	Perceived seriousness of nature preservation issues, such as loss of wildlife (bivariate)	Yes	+
	Perceived seriousness of nature preservation issues, such as loss of wildlife (multivariate)	Yes	+
	Perceived seriousness of global environmental problems (bivariate)	Yes	+
	Perceived seriousness of global environmental problems (multivariate)	Yes	O
	Perceived seriousness of neighborhood environmental problems (bivariate)	Yes	O
	Perceived seriousness of neighborhood environmental problems (multivariate)	Yes	O
O'Connor, Bord, and Fisher 1999	Voluntary action (e.g. carpool; full model)	Yes	+
	Voting intentions (e.g. vote for gas tax; full model)	Yes	–
O'Connor, Bord, Yarnal, and Wiefek 2002	Voting intentions (e.g. vote for gas tax)	Yes	O
	Willingness to select clean energy option from power company		O
	Willingness to buy green products		O
	Willingness to suffer discomfort to help environment		O
	Willingness to drive less		O
Slimak and Dietz 2006	Ecological risk scale (e.g. concern for wetland loss)	Yes	O
	Chemical risk scale (e.g. concern for hazardous waste sites)	Yes	O
	Global risk scale (e.g. concern for population growth)	Yes	O
	Biological risk scale (e.g. concern for GMOs)	Yes	O
Uyeki and Holland 2000	Pro-environment orientation	Yes	O
	Less growth orientation	Yes	+
	Pro-animal orientation	Yes	+

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Inconsistent Findings

Only two of the 128 dependent measures of environmental concern suggest that women express a lower level of concern for the environment than men. O'Connor, Bord, and Fisher (1999) find that women are less likely than men to vote favorably for legislative measures (such as a gas tax on consumers or an energy tax on businesses) to help reduce environment damage[14]. O'Connor and his colleagues (1999) interpret their finding as a possible reflection that women are less comfortable in the political realm than are men, especially in contrast to their finding that women are more likely than men to engage in voluntary action such as carpooling to work to reduced environmental damage. The authors fail, however, to discuss their findings within the framework of their model building techniques. In all of their reduced models, there is no significant difference between men and women regarding their likelihood to vote favorably for legislative measures to help reduce environmental damage. The finding that women are less likely than men to vote for such measures only shows up in the full model, indicating the presence of an interaction between gender and some other predictor in their model. The researchers do not report testing for these potentially moderated effects.

Similarly, Leiserowitz (2006) finds that women are less likely than men to support national policies that address global warming. The focus of Leiserowitz's (2006) article is not gender; therefore, aside from reporting the findings for the control variables in the models, there is no discussion or interpretation of the results. There are again, however, differences between the reduced and full model: in the reduced model

[14] The variable measured is a scale of seven variables created using factor analysis.

Leiserowitz (2006) finds that women are *more* likely than men to support national policies that address global warming and in the full model the significance is reduced and the sign of the regression coefficient changes direction. This indicates the very likely presence of an interaction between gender and at least one other predictor in the model, yet the author does report testing for these moderated effects.

Overall, although two measures of environmental concern are associated with the finding that women are less likely than men to support legislative efforts to reduce environmental damage, neither result is necessarily indicative of the true relationship between gender and environmental concern. When each finding is considered in the context of the model building techniques used by the authors, the findings indicate that interaction effects are likely present. Assuming that these interactions were not tested, readers do not have enough information to adequately interpret the results. Thus, given that only two measures of environmental concern (or 1.6 percent of the 128 survey items in the sample) were associated with gender in a way to suggest that women express lower levels of concern for the environment than men, there is very little evidence to suggest that women care less about the environment than men.

Consistent Patterns of Concern

Most of the previously published studies examined here provide evidence to suggest that women express *greater* concern for the environment than men. Sixty-seven survey items (or 52.3 percent of the 128 measures of environmental concern in the sample) are associated with gender in such a way as to suggest that women express a greater concern for the environment than men. Yet, there is also ample evidence to suggest that there is *no difference* between men's and women's levels of

environmental concern; fifty-nine survey items (or 46.1 percent of the 128 questions in the sample) showed no significant difference between men's and women's levels of environmental concern. Based on these results, it is necessary to ask under what circumstances do women care more about the environment than men and when is there no discernable difference between the levels of environmental concern of men and women?

There are no obvious explanations for these varied findings. Both those studies that reported women having greater levels of environmental concern and those studies that reported no difference between men and women utilized national level samples as well as regional and local level samples. The collective studies had a mix of urban and rural samples and included both small and large sample sizes. There is no obvious pattern with regard to the type of dataset or survey method used. Thus, to further analyze the data, the 128 measures of environmental concern were each categorized into one of eight typologies: (1) support for animal welfare, (2) ecological paradigm, (3) economy versus environment, (4) health and safety concerns, (5) willingness to take personal action to help the environment, (6) support for environmental policy/legislation, (7) trust/belief in the environmental movement, and (8) willingness to pay to protect the environment. Then within four of the categories (ecological paradigm, economy versus environment, health and safety concerns, and support for environmental policy/legislation) survey items were further classified as global (or generic) measures of environmental concern versus local (or specific) measures of environmental concern[15].

[15] See Chapter Four for a more detailed description of the methods used to categorize each measure and see Table A.3 in the Appendix for the specific categorization of each of the 128 survey items.

Table 5.2 delineates each category (including the global or generic versus the local or specific subcategories) by differencing levels of environmental concern between men and women.

As Table 5.2 illustrates, women are more likely than men to express concern for animal welfare across all measures of concern for animal welfare, however, only five questions in the entire sample directly assess concern for animal welfare so the evidence offered here remains weak. The ecological paradigm category, however, has a large number of questions (35) and unclear findings: 17 measures of environmental concern find that women are more likely than men to have an ecological paradigm or worldview but 16 measures find no difference between men and women and their ecological worldview. Refining this category to differentiate global versus local questions offers little additional insight nor does it provide support for the hypothesis that women are more likely to express greater concern for the environment than men when questions are framed as local versus global (Blocker and Eckberg 1989; Mohai 1992, 1997).

Table 5.2 Categorization of Environmental Concern Measures by Differing Levels of Environmental Concern Between Men and Women

Category	+	–	O	Total
Support for Animal Welfare	**5**			5
Ecological Paradigm	**17**		**16**	33
Global or Generic Question	15		9	
Local or Specific Question	2		7	
Economy versus Environment	**4**		**2**	6
Global or Generic Question	3		1	
Local or Specific Question	1		1	
Health and Safety Concerns	**23**		**20**	43
Global or Generic Question	8		2	
Local or Specific Question	15		18	
Willingness to Take Personal Action to Help Environment	**9**		**9**	18
Support for Environmental Policy/Legislation	**2**	**2**	**7**	11
Global or Generic Question	1	2	6	
Local or Specific Question	1		1	
Trust/Belief in Environmental Movement	**6**		**1**	7
Willingness to Pay to Protect the Environment	**1**		**4**	5

+ Women express greater concern for the environment than men

– Women express lower levels of concern for the environment than men

O No difference between men's and women's levels of environmental concern

Only six questions are categorized in the economy versus environment typology. Four are associated with the finding that women are more likely than men to support the environment over the economy, while two measures are associated with a finding of no difference between men and women when asked questions that position the economy against the environment. Davidson and Freudenburg (1996) also looked at the relationship between gender and the economy versus the environment. One of the five hypotheses they assessed was the *economic salience hypothesis*, which suggest that men have more concern for economics than women and, therefore, less concern for the environment. Davidson and Freudenburg (1996) found inconclusive support for this hypothesis. Regardless of inconclusive evidence, however, support for the economy as a barrier to support for the environment is a theory frequently used to explain low levels

of environmental concern among men. Perhaps mediating and moderating effects between gender and class, race, or political party affiliation might help explain the varied findings as well as the popular and anecdotal use of this theory despite inconclusive evidence to support it.

The health and safety concerns category included the most survey items (43), yet again, the results are split: 23 survey items indicate that women have greater concern for the environment when there is a health or safety risk involved but 20 survey items indicate that there is no difference between men and women even when the environmental issue is framed as a health or safety concern. These inconclusive results vary from that of Davidson and Freudenburg (1996) and others (see Blocker and Eckberg 1989, 1997; Bord and O'Connor 1997; Marshall 2004; Mohai 1992, 1997; O'Connor, Bord, Yarnal, and Wiefek 2002) who have found consistent support for the *health and safety hypothesis*. Perhaps the differences between men and women regarding health and safety concerns are narrowing over time as the health and safety risks of environmental damage become more familiar to the general public (with the increased prevalence of the environmental movement).

Furthermore, the results of the global (or generic) versus local (or specific) subcategories of the health and safety typology offer little to explain the inconclusive results. If women tend to express greater concern for the environment than men when issues and solutions are framed as *local versus global* (Blocker and Eckberg 1989; Mohai 1992, 1997) then it would be expected that the posing of global or generic health and safety questions would result in little difference between men's and women's concern for the environment, but local or specific questions that suggest a personal or

direct health or safety risk to a family or community would garner greater concern from women than men. My survey of the recent literature shows that 18 of the 20 survey items that were associated with no difference between men's and women's concern for the environment were questions directly assessing concern for local or specific health and safety problems due to environmental factors.

Willingness to take personal action to help the environment is a category that speaks to the *ethics of caring* debate. There are 18 questions that assessed willingness to take personal action (or responsibility) for environmental protection. Nine survey items found that women are more likely than men to take personal action to help the environment and nine survey items found no difference between the personal responsibility men and women are willing to take to help the environment. These findings are in contrast to Zelezny, Chua, and Aldrich (2000) who find consistent support for women expressing a greater sense of personal responsibility to improve environmental conditions than men.

There is weak evidence to suggest that women are no more likely to support environmental policy or legislation than men: seven out of 11 items found no difference between men's and women's support for environmental policy, two items found that women are less likely to support environmental policy or legislation than men, and two items found that women are more likely to support environmental policy or legislation than men. There is also weak evidence (six out of seven survey questions) to suggest that women have more trust or belief in the environmental movement than men. One survey found no difference between men's and women's trust or belief in the environmental movement.

Furthermore, there is weak evidence (four out of five measures) to suggest that men and women are equally likely to pay to protect the environment. Only one survey item is associated with the finding that women are more likely than men to pay to protect the environment. It should be reiterated that willingness to pay (or contingent valuation) variables are often critiqued as flawed measurements, primarily because an ability to pay is a necessary precondition to willingness to pay.

Conclusions

Overall, it can be concluded that women are more likely than men to express concern for the environment. The majority of survey items in the sample (52.3 percent) found that women express greater concern for the environment than men, consistent with Davidson and Freudenberg's (1996) findings from more than a decade ago. However, 46.1 percent of the measures of environmental concern in the sample are associated with no difference between men's and women's level of concern. Identifying patterns to help explain under what circumstances women are more likely to express greater levels of concern than men and when men's and women's environmental concern is likely not to differ is significantly more challenging.

The most conclusive pattern is that women are more likely to express greater levels of environmental concern than men when issues involve animal welfare. This is consistent with the large volume of feminist (and eco-feminist) literature calling for women to be concerned about animal welfare and debating the merit of vegetarianism as a feminist issue (see e.g., Adams 1990, 2003; Adams and Donovan 1995; Merchant 1980; Mies and Shiva 1993; Shiva 1989; Warren 2000). However, discussion of animal

welfare (as a gendered issue) has been largely absent from the environmental values and concern literature. To my knowledge, the pattern of women expressing greater concern for animal welfare than men has not been established. Furthermore, the traditional explanations into why men and women have differing levels of environmental concern (e.g., health and safety concerns of women, competing economic interests of men, and the prioritization of children by women) do little to explain differences in support for animal welfare. For that reason alone this finding has significant implications, in addition there are increasing public concerns for animal welfare as it relates to our current food production system.

Other patterns (although supported by weak evidence) suggest that women are slightly more likely than men to support the environment over the economy and women are more likely than men to trust or believe in the efforts of the environmental movement. There is also weak evidence to support that men's and women's environmental concern does not differ regarding support for environmental policy or legislation and willingness to pay for environmental protection. The evidence is inconclusive regarding the difference between men's and women's ecological paradigm or worldview, concerns of health and safety issues as they relate to environmental problems, and willingness to take personal action to help protect the environment.

Many researchers have suggested that the wording of survey questions matters with regard to the significance of findings and the interpretation of results, thus differences in question wording and the type of environmental concern being measured helps explain varied findings between men's and women's levels of environmental concern. I support this argument but believe that it provides only a partial explanation.

The 128 survey questions in this sample were grouped by types of environmental concern, yet the evidence for establishing patterns along these grounds is weak or inconclusive. I believe that the exploration of mediating and moderating effects of gender and other socio-demographic correlates of environmental concern will help provide a better understanding of these complex patterns. As discussed earlier with regard to the two survey indicators associated with men's greater concern for the environment, there might be untested interaction effects in many of these published models. There were several instances among the studies where indications of mediating and moderating effects were likely present but the researchers did not discuss nor test for such effects. For example, Blocker and Eckberg (1997) have several findings that are not significant in the bivariate models but become significant in the multivariate models (and vice versa), but they do not discuss the non-significant findings nor mention the possibility of mediating and moderating effects. Specifically, they found no significant difference between men's and women's likelihood to engage in personal green activities to help the environment in their bivariate model but found in their multivariate model that women are more likely than men to engage in personal green activities. The exploration of interaction effects here could provide some insight into the inconclusive findings in this systematic review regarding men's and women's willingness to take personal action to help the environment.

CHAPTER SIX

MEDITING EFFECTS OF GENDER AND DEMOGRAPHIC CHARACTERISTICS OF ENVIRONMENTAL CONCERN

The second analytical section of this study addresses the following research questions using statistical techniques that test for mediating effects:

(3) Are there mediating effects between gender and socio-demographic factors with regard to environmental concern?

(5) If there are mediating and moderating effects, are they consistent across a variety of datasets using different samples and different measures of environmental concern?

Results

Descriptive Statistics

Tables 6.1, 6.2, 6.3, and 6.4 show the means and standard deviations for the dependent and independent variables, as well as the percent distribution for the dichotomous and categorical variables. Tables 6.1 and 6.2 show the descriptive statistics for variables from the GSS dataset; tables 6.3 and 6.4 show the descriptive statistics for variables from the ANES dataset. The coding for variables is placed in parenthesis. For all of the dependent variables a higher number represents greater concern for the environment. Factors measuring willingness to pay for environmental protection, perceived dangers of environmental degradation, and opportunity cost of environmental sacrifice from the GSS dataset are composite variables created from the PCA methodology discussed in Chapter Four.

Table 6.1 Means, Standard Deviations, and Percent for Dependent Variables – GSS Dataset

Variables	Mean	Standard Deviation	n*	Percent
Willingness to pay	-.004	.870	1198	
Fear of environmental destruction	-.016	.778	1231	
Opportunity cost	-.017	.682	1249	
Reliance on science	2.260	.799	1139	
Agree (=1)			254	22.300
Neither agree nor disagree			335	29.412
Disagree (=3)			550	48.288
Modern life harms the environment	2.126	.879	1171	
Agree (=3)			535	45.687
Neither agree nor disagree			249	21.264
Disagree (=1)			387	33.049
Economic growth protects the environment	1.766	.819	1139	
Agree (=1)			546	47.937
Neither agree nor disagree			313	27.480
Disagree (=3)			280	24.583
Growth harms the environment	1.709	.770	1148	
Agree (=3)			222	19.338
Neither agree nor disagree			370	32.230
Disagree (=1)			556	48.432
Concerned about population growth	2.350	.797	1150	
Agree (=3)			637	55.391
Neither agree nor disagree			279	24.261
Disagree (=1)			234	20.348
Progress is dependent on the health of environment	2.333	.756	1111	
Agree (=3)			564	50.765
Neither agree nor disagree			353	31.773
Disagree (=1)			194	17.462
Likelihood of damage from a nuclear accident	.560	.497	1069	
Likely (=1)			599	56.034
Unlikely			470	43.966
I help the environment	2.337	.749	1176	
Agree (=3)			594	50.510
Neither agree nor disagree			384	32.653
Disagree (=1)			198	16.837

* Environment questions asked to a subsample of 1276 respondents

Table 6.2 Means, Standard Deviations, and Percent for Independent Variables - GSS Dataset

Variables		Mean	Standard Deviation	n*	Percent
Male		.436	.496	2817	
	Yes (=1)			1229	43.628
	No			1588	56.372
Age		46.022	17.366	2809	
White		.786	.410	2817	
	Yes (=1)			2213	78.559
	No			604	21.441
Low Class		.507	.500	2803	
	Yes (=1)			1422	50.731
	No			1381	49.269
Years of education		13.265	2.869	2808	
Republican		.244	.429	2805	
	Yes (=1)			684	24.385
	No			2121	75.615
Reside in urban setting		.439	.496	1207	
	Yes (=1)			530	43.911
	No			677	56.089
Ever been married		.747	.435	2816	
	Yes (=1)			2104	74.716
	No			712	25.284
Number of children		1.799	1.663	2801	
Religious		.859	.349	2813	
	Yes (=1)			2415	85.851
	No			398	14.149
Believe in evolution		.462	.499	1095	
	Yes (=1)			506	46.210
	No			589	53.790

*Survey was administered to 2817 respondents; reside in urban setting & believe in evolution variables were asked to a subsample of 1276 respondents

Table 6.3 Means, Standard Deviations, and Percent for Dependent Variables – ANES Dataset

Variables	Mean	Standard Deviation	n*	Percent
Feelings toward environmentalists	66.469	21.084	2011	
Lower power plant emissions	2.499	.777	1131	
Favor (=3)			764	67.551
Neither favor nor oppose			167	14.766
Oppose (=1)			200	17.683
Support for gas tax	1.444	.758	1141	
Favor (=3)			187	16.389
Neither favor nor oppose			133	11.656
Oppose (=1)			821	71.954

*Survey was administered to 2323 respondents; *lower power plant emissions* & *support for gas tax* variables were asked to a subsample of 1161 respondents

Table 6.4 Means, Standard Deviations, and Percent for Independent Variables - ANES Dataset

Variables	Mean	Standard Deviation	n*	Percent
Male	.430	.495	2322	
Yes (=1)			999	43.023
No			1323	56.977
Age	47.014	17.222	2300	
White	.513	.500	2306	
Yes (=1)			1183	51.301
No			1123	48.699
Low & working class	.574	.495	2237	
Yes (=1)			1283	57.354
No			954	42.646
Educational attainment	3.932	1.564	2311	
Grades 0-8 (=1)			103	4.457
Grades 9-12/ no diploma or equivalency			239	10.342
High school diploma or equivalency			764	33.059
13+ grades/ no degree			452	19.559
Junior or community college degree			260	11.251
Bachelor of arts/ science degree			341	14.756
Advanced degree (=7)			152	6.577
Republican thermometer	44.786	25.998	2252	
Reside in urban setting	.799	.401	2170	
Yes (=1)			1734	79.908
No			436	20.092
Ever been married	.722	.448	2308	
Yes (=1)			1666	72.184
No			642	27.816
Religious	.829	.377	2299	
Yes (=1)			1906	82.906
No			393	17.094

*Survey was administered to 2323 respondents

Among the categorical dependent variables from the GSS dataset (Table 6.1), concerned about population growth, progress is dependent on the health of environment, and I help the environment have the highest means (greater than 2.3 where values ranged from 1 to 3). Thus, respondents self reported the greatest level of environmental concern when presented with the following questions:

How much do you agree or disagree with each of these statements?

- The earth cannot continue to support population growth at its present rate.
- Economic progress in America will slow down unless we look after the environment better.
- I do what is right for the environment, even when it costs more money or takes up more time.

Interestingly, these three single item indicator questions are measuring vastly different concepts (population pressure concern, feelings about the economy as it relates to the environment, and personal behavior or action taken to address environmental problems), yet all yielded the greatest support for the environment among the eight categorical dependent variables from the GSS dataset.

Interestingly, the two categorical dependent variables from the ANES dataset (lower power plant emissions and support for gas tax; Table 6.3) have opposite percentages regarding the level of environmental concern reported by respondents. The majority of respondents (67.55 percent) favor government restrictions to reduce harmful emissions from power plants (17.68 percent oppose such restrictions). However, only 16.39 percent of respondents favor a government gas tax to reduce driving and/ or reduce the purchase of cars that have inefficient gas mileage, whereas

71.95 percent oppose such a gas tax. These differences are likely a reflection of the amount of personal sacrifice required to implement these particular emission restriction measures, where restrictions on power plant emissions require sacrifice from industry while a gas tax requires sacrifice from individual consumers. Furthermore, as discussed in-depth in Chapter Three, data involving the willingness to pay for protection (WTP) as a representation of environmental concern may minimize the complex dynamics between the environment and the economy (Kalof and Satterfield 2005).

There are slightly more women than men respondents in both the GSS (56.37 percent woman respondents; Table 6.2) and ANES (56.98 percent woman respondents; Table 6.4) datasets. Additionally, as reported in Table 6.2 a large percentage of respondents in the GSS dataset are white (78.56 percent), not Republican (75.62 percent), are either currently married or have been at some point in their lifetime (74.72 percent), and are religious (85.85 percent). By contrast, in the ANES dataset (Table 6.4) the percentage of white respondents (51.30 percent) is more evenly distributed with respondents who are non-white (48.70 percent). Yet the uneven distribution of a few variables remains, the majority of respondents are either currently married or have been at some point in their lifetime (72.18 percent), are religious (82.91 percent), and reside in an urban setting (79.91). The majority of respondents in the GSS dataset (Table 6.2), however, do not reside in an urban setting (56.09). These differences are likely the result of different sampling techniques and differences in the study population.

Bivariate Analysis

Tables 6.5 (GSS dataset) and 6.6 (ANES dataset) display the bivariate relationships between gender and the 14 measures of environmental concern[16]. This provides an initial method for looking at the connections between socio-demographic characteristics and measures of environmental concern. The bivariate findings show that several socio-demographic characteristics are associated with multiple measures of environmental concern but not necessarily in a consistent manner.

Specifically, in the GSS dataset (Table 6.5) male is a positive predictor of willingness to pay ($b = .134$, $p<.01$) indicating that men are more willing to pay for environmental protection than women. Yet male is a negative predictor of reliance on science (OR = .68, $p<.01$), growth harms the environment (OR = .78, $p<.05$), progress is dependent on the health of environment (OR = .76, $p<.05$), and likelihood of damage from a nuclear accident (OR = .56, $p<.001$) indicating that men have faith in science to solve our environmental problems, are less concerned about economic growth harming the environment, are less concerned about the effects of environmental damage on the economy, and are less concerned about the possibility of nuclear damage than women. Furthermore, in the ANES dataset (Table 6.6) male is negatively correlated with feelings toward environmentalists ($b = -5.165$, $p<.001$) indicating that men feel less favorable towards environmentalists than women. With the exception of willingness to pay, the significant correlations between male and various measures of environmental concern generally support the prevailing theory that women express greater concern for the

[16] See Table A.4 in Appendix for bivariate results of all other socio-demographic characteristics and the 14 measures of environmental concern.

environment than men (Davidson and Freudenburg 1996). However, male is not significantly related to eight of the fourteen dependent variables: six specific measures of environmental concern in the GSS dataset (environmental problems are dangerous, opportunity cost, modern life harms the environment, economic growth protects the environment, concerned about population growth, I help the environment and two specific measures of environmental concern in the ANES dataset (lower power plant emissions and support for gas tax). Thus, the bivariate findings provided mixed evidence concerning the significance of gender as a predictor of environmental concern as well as mixed evidence concerning the direction of the relationship between gender and measures of environmental concern.

All of the other socio-demographic characteristics have at least two significant relationships with the 14 measures of environmental concern; however, the direction of the relationships is not necessarily consistent. For example, education is a significant predictor of environmental concern in 10 out of 14 models. Education is a positive predictor of environmental concern in six models (willingness to pay, opportunity cost, reliance on science, economic growth protects the environment, I help the environment, and lower power plant emissions). Yet, education is a negative predictor of environmental concern in four models (modern life harms the environment, growth harms the environment, progress is dependent on the health of environment, and likelihood of damage from a nuclear accident). There is no significant relationship between education and four of the 14 measures of environmental concern (environmental problems are dangerous, concerned about population growth, feelings toward environmentalists, and support for gas tax). In addition to education five other

socio-demographic variables (age, race, social class, number of children, and belief in evolution) have inconsistent findings regarding the direction of the relationships[17].

The lack of consistent findings regarding the significance and direction of socio-demographic characteristics and measures of environmental concern could point to the importance of question wording and the inherent variability associated with opinion research. A challenge to using GSS trend data is the limitation of single-item indicators; no two indicators measure a single concept in the same way, and no one indicator can be expected to measure an intended concept in its entirety (Jones and Dunlap 1992). The inconsistent findings could also, however, be related to the presence of mediating and moderating effects.

Four independent variables (political party, place of residence, marital status, and religious affiliation) did produce consistent results regarding the direction of the relationships across measures of environmental concern. Republican and Republican thermometer are negative predictors of nine out of 14 measures of environmental concern (willingness to pay, environmental problems are dangerous, modern life harms the environment, growth harms the environment, concerned about population growth, progress is dependent on the health of environment, likelihood of damage from a nuclear accident, feelings toward environmentalists, and lower power plant emissions). Thus, the bivariate findings generally indicate that Republicans and those who feel warmness toward the Republican Party express less concern for the environment than non-Republicans; this is consistent with current research (Dunlap and McCright 2008; Jones and Dunlap 1992; Van Liere and Dunlap 1980).

[17] See Table A.4 in Appendix for full results.

Furthermore, place of residence is a positive predictor of two of 14 measures of environmental concern (environmental problems are dangerous and feelings toward environmentalists) indicating that those who reside in an urban setting are more concerned about the environment than those who do not reside in an urban setting. Yet place of residence is not significantly related to 12 of 14 measures of environmental concern (willingness to pay, opportunity cost, reliance on science, modern life harms the environment, economic growth protects the environment, growth harms the environment, concerned about population growth, progress is dependent on the health of environment, likelihood of damage from a nuclear accident, I help the environment, lower power plant emissions, and support for gas tax) suggesting that place of residence is generally not a significant predictor of environmental concern. These findings are also consistent with previous literature that finds urban residents to express greater concern for the environment than their rural counterparts (Jones and Dunlap 1992), yet these urban/rural differences seem to be narrowing overtime (Jones, Fly, Talley, and Cordell 2003).

Marital status is a negative predictor of four of 14 measures of environmental concern (willingness to pay, opportunity cost, growth harms the environment, and feelings toward environmentalists) indicating that those who are currently married or who have been married at some point during their lifetime express less concern for the environment than those who have never been married. Yet marital status is not significantly related to 10 of 14 measures of environmental concern (environmental problems are dangerous, reliance on science, modern life harms the environment, economic growth protects the environment, concerned about population growth,

progress is dependent on the health of environment, likelihood of damage from a nuclear accident, I help the environment, lower power plant emissions, and support for gas tax) suggesting that marital status is generally not a significant predictor of environmental concern.

Religious affiliation is a negative predictor of five out of 14 measures of environmental concern (willingness to pay, environmental problems are dangerous, opportunity cost, concerned about population growth, and support for gas tax) and not significantly related to nine out of 14 measures of environmental concern (reliance on science, modern life harms the environment, economic growth protects the environment, growth harms the environment, progress is dependent on the health of environment, likelihood of damage from a nuclear accident, I help the environment, feelings toward environmentalists, and lower power plant emissions). Thus, indicating mixed evidence concerning the significance of religious affiliation as a predictor of environmental concern. Exploring multivariate models will provide more rigorous tests of the relationships between socio-demographic characteristics of survey respondents and levels of environmental concern and help determine if these bivariate relationships persist when analyzed with controls.

Table 6.5 Bivariate Analysis Between Measures of Environmental Concern and Gender - GSS Dataset

	OLS		Ordered Logistic Regression		Logistic Regression	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Willingness to pay	.134 **	.051				
Environmental problems are dangerous	-.054	.045				
Opportunity cost	.016	.039				
Reliance on science			(.68) -.380 **	.112		
Modern life harms the environment			(.94) -.057	.110		
Economic growth protects the environment			(1.02) .016	.112		
Growth harms the environment			(.78) -.251 *	.113		
Concerned about population growth			(1.12) .110	.115		
Progress is dependent on the health of environment			(.76) -.269 *	.115		
Likelihood of damage from a nuclear accident					(.56) -.583 ***	.125
I help the environment			(.95) -.053	.111		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.6 Bivariate Analysis Between Measures of Environmental Concern and Gender– ANES Dataset

	Robust Regression		Ordered Logistic Regression	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Feelings toward environmentalists	-5.165 ***	.942		
Lower power plant emissions			(1.12) .113	.126
Support for gas tax			(1.15) .136	.131

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Multivariate Analysis

Tables 6.7 through 6.17 display the results of eleven multivariate regression models using dependent variables from the GSS dataset. Tables 6.7, 6.8, and 6.9 specifically display the results of the multivariate OLS regression models predicting levels of environmental concern for three composite variables created from the PCA methodology (willingness to pay, environmental problems are dangerous, and opportunity cost). Tables 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, and 6.17 display the results of the ordered logistic regression models predicting levels of environmental concern for seven categorical variables from the GSS dataset (reliance on science, modern life harms the environment, economic growth protects the environment, growth harms the environment, concerned about population growth, progress is dependent on the health of environment, and I help the environment). Table 6.16 displays the results of the logistic regression models predicting respondents' levels of concern regarding the possibility of a nuclear accident (likelihood of damage from a nuclear accident). Tables 6.18 through 6.20 display the results of three multivariate regression models using dependent variables from the ANES dataset. Table 6.18 specifically displays the results of the multivariate OLS regression models predicting respondents' feelings toward environmentalists (feelings toward environmentalists). Tables 6.19 and 6.20 display the results of the ordered logistic regression models predicting levels of environmental concern for two categorical variables from the ANES dataset (lower power plant emissions and support for gas tax).

As discussed in Chapter Four, model building techniques are used for the purpose of looking for mediating and moderating effects. Outside of theoretical reasons

to expect interaction effects, model building can help indentify potential mediating and moderating effects between variables. For example, if an effect becomes non-significant between the reduced model and the full model the potential for a mediated effect exists (this can also indicate a spurious relationship). Also, if the regression coefficient (or effect size) increases and/ or if the regression coefficient becomes more significant between the reduced and full models there is the potential for an interaction effect to be present. Results that provide the opposite sign of what the researcher would expect and/ or if the results are not significant but theory and previous literature suggests the results should be are all flags signaling the potential of a moderated effect.

Table 6.7 OLS Multivariate Regression Models of Willingness to Pay

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	.110	*	.052	.064		.055
Age	-.004	**	.002	-.001		.002
White	.035		.065	.066		.070
Low class	-.199	***	.053	-.196	**	.056
Years of education	.033	***	.009	.028	**	.010
Republican	-.198	**	.060	-.205	**	.063
Reside in urban setting	-.001		.052	-.012		.055
Ever been married				-.116		.071
Number of children				-.018		.019
Religious				-.115		.081
Believe in evolution				.077		.057
Adjusted R^2	.042			.048		
N	1145			1001		

* p<.05 ** p<.01 *** p<.001

Table 6.8 OLS Multivariate Regression Models of Environmental Problems are Dangerous

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	-.029		.046	-.023		.048
Age	-.002		.001	-.004	*	.002
White	-.108		.057	-.074		.061
Low class	-.038		.047	-.017		.049
Years of education	.009		.008	.005		.009
Republican	-.202	***	.053	-.221	***	.055
Reside in urban setting	.108	*	.046	.079		.048
Ever been married				-.013		.062
Number of children				.002		.017
Religious				-.147	*	.071
Believe in evolution				.070		.049
Adjusted R^2	.024			.036		
N	1177			1033		

* p<.05 ** p<.01 *** p<.001

Table 6.9 OLS Multivariate Regression Models of Opportunity Cost

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	-.052		.038	-.073		.040
Age	-.006	***	.001	-.005	**	.001
White	.305	***	.047	.288	***	.051
Low class	-.046		.039	-.052		.041
Years of education	.058	***	.007	.051	***	.007
Republican	-.159	***	.044	-.142	**	.046
Reside in urban setting	.041		.038	.025		.040
Ever been married				.005		.052
Number of children				-.029	*	.014
Religious				-.133	*	.059
Believe in evolution				.028		.041
Adjusted R^2	.130			.129		
N	1191			1043		

* p<.05 ** p<.01 *** p<.001

Table 6.10 Ordered Logistic Regression Models of Reliance on Science

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(.61) -.487	***	.118	(.64) -.443	***	.126
Age	(1.01) .008	*	.004	(1.01) .011	*	.004
White	(1.22) .199		.148	(1.13) .120		.160
Low class	(1.02) .018		.122	(.98) -.018		.130
Years of education	(1.11) .100	***	.022	(1.09) .089	***	.024
Republican	(1.12) .116		.138	(1.12) .116		.146
Reside in urban setting	(.99) -.006		.119	(1.02) .024		.128
Ever been married				(.86) -.151		.165
Number of children				(1.01) .013		.044
Religious				(.92) -.088		.183
Believe in evolution				(.80) -.228		.129
Pseudo R^2	.021			.020		
N	1087			965		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.11 Ordered Logistic Regression Models of Modern Life Harms the Environment

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(1.01) .008		.115	(1.09) .087		.124
Age	(.99) -.007	*	.003	(.99) -.010	*	.004
White	(1.00) .003		.146	(1.01) .005		.159
Low class	(1.06) .057		.119	(1.14) .134		.128
Years of education	(.94) -.059	**	.021	(.94) -.062	**	.023
Republican	(.69) -.367	**	.132	(.65) -.427	**	.141
Reside in urban setting	(1.10) .092		.116	(1.07) .071		.125
Ever been married				(.93) -.074		.161
Number of children				(1.01) .012		.043
Religious				(1.01) .011		.185
Believe in evolution				(1.20) .183		.127
Pseudo R^2	.010			.017		
N	1118			987		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.12 Ordered Logistic Regression Models of Economic Growth Protects the Environment

	Model 1		Model 2	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	(.96) -.046	.116	(.97) -.027	.125
Age	(.99) -.003	.004	(.99) -.005	.004
White	(1.62) .483 **	.149	(1.49) .399 *	.161
Low class	(.99) -.009	.120	(.95) -.049	.128
Years of education	(1.04) .043 *	.022	(1.04) .039	.023
Republican	(.84) -.173	.135	(.82) -.197	.144
Reside in urban setting	(1.04) .036	.117	(.98).-.023	.124
Ever been married			(.96) -.039	.161
Number of children			(.99) -.006	.043
Religious			(.88) -.130	.181
Believe in evolution			(.88) -.123	.128
Pseudo R^2	.008		.007	
N	1089		964	

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.13 Ordered Logistic Regression Models of Growth Harms the Environment

	Model 1		Model 2	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	(.84) -.175	.118	(.84) -.169	.127
Age	(.99) -.002	.004	(.99) -.002	.004
White	(.76) -.280	.148	(.67) -.396 *	.160
Low class	(1.02) .021	.122	(.99) -.000	.130
Years of education	(.87) -.142 ***	.022	(.86) -.151 ***	.024
Republican	(.78) -.245	.138	(.79) -.235	.147
Reside in urban setting	(1.12) .113	.119	(1.05) .047	.127
Ever been married			(.85) -.167	.163
Number of children			(.98) -.024	.044
Religious			(.94) -.058	.185
Believe in evolution			(1.11) .100	.129
Pseudo R^2	.029		.034	
N	1098		976	

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.14 Ordered Logistic Regression Models of Concerned About Population Growth

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(1.14) .132		.120	(1.11) .105		.130
Age	(1.00) .003		.004	(1.01) .006		.005
White	(1.64) .497	**	.149	(1.48) .393	*	.163
Low class	(.93) -.076		.124	(.94) -.066		.133
Years of education	(.99) -.000		.022	(.97) -.033		.025
Republican	(.67) -.403	**	.138	(.69) -.376	*	.148
Reside in urban setting	(1.08) .077		.121	(1.04) .037		.131
Ever been married				(.96) -.038		.169
Number of children				(.92) -.087		.046
Religious				(.62) -.486	*	.202
Believe in evolution				(1.80) .589	***	.134
Pseudo R^2	.009			.030		
N	1098			972		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.15 Ordered Logistic Regression Models of Progress is Dependent on the Health of Environment

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(.85) -.168		.119	(.81) -.217		.127
Age	(1.01) .009	*	.004	(1.01) .007		.004
White	(.73) -.310	*	.151	(.80) -.217		.166
Low class	(1.10) .095		.123	(1.16) .152		.131
Years of education	(.97) -.028		.022	(.97) -.028		.024
Republican	(.67) -.397	**	.137	(.66) -.422	**	.146
Reside in urban setting	(.97) -.030		.120	(.98) -.019		.129
Ever been married				(.91) -.099		.167
Number of children				(1.02) .023		.046
Religious				(.96) -.039		.186
Believe in evolution				(1.06) .062		.132
Pseudo R^2	.014			.014		
N	1073			948		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.16 Logistic Regression Models of Likelihood of Damage from a Nuclear Accident

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(.63) -.468	***	.130	(.62) -.481	**	.140
Age	(1.00) .003		.004	(1.01) .006		.005
White	(.60) -.512	**	.175	(.52) -.649	**	.189
Low class	(1.06) .060		.136	(1.07) .065		.145
Years of education	(.93) -.068	**	.024	(.93) -.069	**	.026
Republican	(.69) -.370	*	.146	(.71) -.337	*	.156
Reside in urban setting	(1.10) .099		.133	(1.01) .009		.142
Ever been married				(.87) -.137		.185
Number of children				(.97) -.026		.050
Religious				(.79) -.238		.209
Believe in evolution				(1.26) .227		.145
Pseudo R^2	.038			.042		
N	1028			918		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.17 Ordered Logistic Regression Models of I Help the Environment

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(.96) -.042		.116	(.97) -.034		.124
Age	(1.02) .020	***	.004	(1.02) .018	***	.004
White	(.74) -.300	*	.148	(.75) -.283		.159
Low class	(.98) -.019		.121	(1.03) .025		.127
Years of education	(1.08) .078	***	.022	(1.09) .087	***	.024
Republican	(1.07) .072		.137	(1.12) .116		.143
Reside in urban setting	(.85) -.167		.118	(.75) -.283	*	.124
Ever been married				(.92) -.087		.160
Number of children				(1.08) .078		.044
Religious				(1.10) .094		.179
Believe in evolution				(1.33) .289	*	.128
Pseudo R^2	.019			.024		
N	1125			1019		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.18 Robust Regression Models of Feelings toward Environmentalists

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	-5.270	***	.982	-5.465	***	.998
Age	.026		.030	.060		.034
White	-8.187	***	1.065	-8.359	***	1.093
Low & working class	.388		1.028	.553		1.037
Educational attainment	.828	*	.336	.879	*	.340
Republican thermometer	-.072	***	.019	-.071	***	.020
Reside in urban setting	.929		1.243	.735		1.257
Ever been married				-2.318		1.286
Religious				-1.108		1.357
N	1753			1735		

* p<.05 ** p<.01 *** p<.001

Table 6.19 Ordered Logistic Regression Models of Lower Power Plant Emissions

	Model 1			Model 2		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	(1.11) .106		.136	(1.10) .093		.138
Age	(.99) -.006		.004	(.99) -.005		.005
White	(1.43) .359	*	.147	(1.46) .377	*	.150
Low & working class	(.94) -.061		.142	(.94) -.059		.143
Educational attainment	(1.10) .097	*	.046	(1.10) .096	*	.046
Republican thermometer	(.99) -.006	*	.003	(.99) -.006	*	.003
Reside in urban setting	(.96) -.044		.177	(.96) -.043		.178
Ever been married				(.95) -.051		.178
Religious				(.97) -.032		.180
Pseudo R^2	.013			.014		
N	989			984		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Table 6.20 Ordered Logistic Regression Models of Support for Gas Tax

	Model 1		Model 2		
	Regression Coefficient	Standard Error	Regression Coefficient		Standard Error
Male	(1.21) .194	.143	(1.10) .098		.146
Age	(1.00) .003	.004	(1.01) .009		.005
White	(.89) -.121	.156	(.81) -.213		.161
Low & working class	(.75) -.285	.150	(.74) -.306	*	.151
Educational attainment	(1.03) .030	.048	(1.04) .035		.049
Republican thermometer	(.99) -.003	.003	(.99) -.002		.003
Reside in urban setting	(1.08) .075	.190	(1.01) .008		.192
Ever been married			(.74) -.308		.188
Religious			(.56) -.584	**	.181
Pseudo R^2	.006		.015		
N	996		991		

(Odds Ratio) * p<.05 ** p<.01 *** p<.001

Willingness to Pay

Table 6.7 displays the results of the multivariate OLS regression models predicting respondents' willingness to pay for environmental protection. Willingness to pay is a composite of three variables from the GSS dataset, the higher the number the more willing the respondent is to pay to help the environment. Based on the reduced model men are more willing to pay to help the environment than women (b = .110, p<.05), yet the effect becomes non-significant in the full model indicating a mediated effect. The effect between gender and willingness to pay is an indirect effect, where the effect of gender on willingness to pay is fully mediated by belief in evolution in the full model. Furthermore, even though willingness to pay variables have been well documented to be tricky for opinion based research and especially within the realm of environmental values research – because of the likelihood to simplify the complex and deeply political relationship between the economy and the environment (Kalof and

Satterfield 2005), the direction of the effect between male and willingness to pay is not what is expected. In both the bivariate reduced and the multivariate reduced models, men are more willing to pay for environmental protection than women yet women have been documented to display greater concern for the environment than men (Davidson and Freudenburg 1996), including in all other significant bivariate and multivariate results from this research. Thus, the presence of an interaction effect between men and one or more socio-demographic characteristics is expected. The effect of gender on willingness to pay may be moderated by another socio-demographic variable.

In addition, age is a negative predictor of willingness to pay so as respondents age there is a decrease in their willingness to pay for environmental protection ($b = -.004$, $p<.01$). This effect also becomes non-significant in the full model indicating the presence of a mediated effect between age and willingness to pay. In both the full and reduced model years of education is a positive predictor of willingness to pay, thus as respondents become more educated their willingness to pay for environmental protection increases ($b = .033$, $p<.001$; $b = .028$, $p<.01$). Lower class status and Republican party membership are both negative predictors of willingness to pay across all models: those who have lower class status are less willing to pay to protect the environment than those who do not self-identify as lower class ($b = -.199$, $p<.001$; $b = -.196$, $p<.01$). And Republicans are less likely to pay to protect the environment than non-Republicans ($b = -.198$, $p<.01$; $b = -.205$, $p<.01$); notice the coefficient becomes slightly bigger between the reduced and full models indicating the possibility of an interaction between Republican and another socio-demographic variable.

Environmental Problems are Dangerous

Table 6.8 displays the results of the multivariate OLS regression models predicting the extent to which respondents' believe environmental problems to be dangerous. Environmental problems are dangerous is a composite of five variables from the GSS dataset; the higher the number the more respondents are concerned about the dangers of environmental degradation. Gender is not a significant predictor of environmental problems are dangerous in either the full or reduced model. Age is a negative predictor of environmental problems are dangerous in the full model ($b = -.004$, $p<.05$) but is not a significant predictor of environmental problems are dangerous in the reduced model, indicating the possibility of a moderated effect. Republican party affiliation is a negative predictor of environmental problems are dangerous across all models ($b = -.202$, $p<.001$; $b = -.221$, $p<.001$) suggesting that Republicans are *less* likely to be fearful of environmental problems than non-Republicans. Again, the coefficient becomes slightly bigger between the reduced and full models indicating the possibility of an interaction between being Republican and another socio-demographic variable or variables. Based on the reduced model those who reside in an urban setting are *more* fearful of the dangers of environmental problems than those who do not live in an urban setting ($b = .108$, $p<.05$), yet the effect becomes non-significant in the full model indicating a mediated effect. Religious is added in the full model and is a negative predictor of environmental problems are dangerous ($b = -.147$, $p<.05$) suggesting that those who self identify as religious are *less* likely to be fearful of environmental destruction than those who do not identify as religious.

Opportunity Cost of Environmental Sacrifice

Table 6.9 displays the results of the multivariate OLS regression models predicting respondents' willingness to sacrifice to help the environment. Opportunity cost is a composite of seven variables from the GSS dataset, the higher the number the more respondents are willing to make personal sacrifices to help the environment. Gender is not a significant predictor of opportunity cost in either the full or reduced model. Age, Republican party affiliation, number of children, and being religiously affiliated are negative predictors of opportunity cost across all models indicating that as respondents age they are *less* willing to make sacrifices to protect the environment (b = -.006, p<.001; b = -.005, p<.01), Republicans are *less* willing to sacrifice for environmental protection than non-Republicans (b = -.159, p<.001; b = -.142, p<.01), as respondents have more children they are *less* willing to sacrifice to protect the environment (b = -.029, p<.05), and those who have a religious affiliation are *less* likely to sacrifice for environmental protection than those who do not have a religious affiliation (b = -.133, p<.05). However, being white and educational attainment are positive predictors of opportunity cost suggesting that those who are classified as white are *more* willing to make sacrifices to protect the environment than non-whites (b = .305, p<.001; b = .288, p<.001) and as respondents gain more years of education they are also *more* willing to sacrifice for environmental protection (b = .058, p<.001; b = .051, p<.001).

Reliance on Science to Solve Environmental Problems

Table 6.10 displays the results of the ordered logistic regression models predicting GSS survey respondents' agreement with the following statement: modern

science will solve our environmental problems with little change to our way of life. Gender is a negative predictor of reliance on science. In the reduced model, men are .61 times *less* likely than women to *disagree* with the idea that science will solve our environmental problems versus being in agreement or neither agreement nor disagreement with the notion that science is the answer to our environmental problems ($p<.001$; OR in full model = .64, $p<.001$). Age (OR = 1.01, $p<.05$; OR = 1.01, $p<.05$) and years of education (OR = 1.11, $p<.001$; OR = 1.09, $p<.001$) are positive predictors of reliance on science.

Modern Life Harms the Environment

Table 6.11 displays the results of the ordered logistic regression models predicting GSS survey respondents' agreement with the following statement: almost everything we do in modern life harms the environment. Gender is not a significant predictor of the attitude that modern life harms the environment. Age (OR = .99, $p<.05$; OR = .99, $p<.05$), years of education (OR = .94, $p<.01$; OR = .94, $p<.01$), and Republican party affiliation (OR = .69, $p<.01$; OR = .65, $p<.01$) are negative predictors of believing that modern life harms the environment across all models. Thus, in the full model Republicans are .65 times *less* likely than non-Republicans to *agree* that our modern lifestyle harms the environment. Furthermore, the effect size of the regression coefficient for Republicans increases slightly between the reduced model (b = -.367) and the full model (b = -.427) indicating the possibility of a moderated relationship between being Republican and another socio-demographic variable.

Economic Growth Protects the Environment

Table 6.12 displays the results of the ordered logistic regression models predicting GSS survey respondents' agreement with the following statement: in order to protect the environment, America needs economic growth. Gender is not a significant predictor of the belief that economic growth protects the environment. White racial status is a positive predictor of believing that economic growth protects the environment in both the full and reduced models (OR = 1.62, p<.01; OR = 1.49, p<.05). Thus, in the full model those who are white are 1.49 times *more* likely than non-whites to *disagree* with the idea that economic growth is necessary for environmental protection. Years of education is a positive predictor of the belief that economic growth protects the environment in only the reduced model (OR = 1.04, p<.05), the effect becomes non-significant in the full model indicating a mediated relationship.

Growth Harms the Environment

Table 6.13 displays the results of the ordered logistic regression models predicting GSS respondents' agreement with the following statement: economic growth always harms the environment. Gender is not a significant predictor of the belief that growth harms the environment in the reduced or full models despite being a negative predictor of environmental concern in the bivariate model, indicating the presence of a mediating effect between male and one or more socio-demographic variables. When socio-demographic variables are added to the bivariate model one at a time, it becomes evident that gender is fully mediated by years of education, political orientation, and belief in evolution. Thus, for example, women are more likely to be Democrats, which in turn is associated with expressing more concern for the environment, so gender is

operating through political orientation and indirectly effects attitudes about growth being harmful to the environment.

Lower class status is not a significant predictor of the attitude that growth harms the environment in the reduced model but becomes a negative predictor of the variable in the full model (OR = .67, p<.05) also indicating the possibility of a moderated effect. Years of education is a negative predictor of the belief that growth harms the environment in both the reduced and full models (OR = .87, p<.001; OR = .86, p<.001). Thus, for the full model for every one year increase in education a respondent is .86 times *less* likely to *agree* that economic growth is always harmful to the environment. Furthermore, the effect size of the regression coefficient for years of education increases slightly between the reduced model (b = -.142) and the full model (b = -.151) indicating the possibility of a moderated relationship between Republican and another socio-demographic variable.

Concerned about Population Growth

Table 6.14 displays the results of the ordered logistic regression models predicting GSS survey respondents' agreement with the following statement: the earth cannot continue to support population growth at its present rate. Gender is not a significant predictor of being concerned about population growth. Being white (OR = 1.64, p<.01; OR = 1.48, p<.05) and believe in evolution (OR = 1.80, p<.001) are positive predictors of being concerned about population growth. Thus, in the full model those who believe in evolution are 1.80 times *more* likely than those who do not believe in evolution to *agree* that our current population growth rate is problematic. However, Republican (OR = .67, p<.01; OR = .69, p<.05) and religious (OR = .62, p<.05) are

negative predictors of being concerned about population growth indicating for example that Republicans are .69 times *less* likely than non-Republicans to *agree* with the statement that the earth cannot continue to support population growth at its present rate.

Progress is Dependent on the Health of Environment

Table 6.15 displays the results of the ordered logistic regression models predicting GSS respondents' agreement with the following statement: economic progress in America will slow down unless we look after the environment better. Gender is not a significant predictor of the belief that progress is dependent on the health of environment in the reduced or full models although male is a negative predictor of progress is dependent on the health of environment in the bivariate model. This indicates the presence of a mediating effect between male and one or more socio-demographic variable. Gender is fully mediated by a collective group of variables: age, years of education, residential location, number of children, and religious affiliation. Thus, gender is operating indirectly through a combination of socio-demographic factors such that an older man, with little education, who lives in a rural setting, has three children, and is Baptist yields a different level of concern for the impact of economic progress on the environment than a young woman, with a college degree, who lives in an urban setting, has no kids, and is Catholic, for example.

In the reduced models, age is a positive predictor of progress is dependent on the health of environment (OR = 1.01, $p<.05$) and white is a negative predictor of progress is dependent on the health of environment (OR = .73, $p<.05$), yet the effects of both become non-significant in the full models indicating the possibility of mediated

relationships. Republican is a negative predictor of progress is dependent on the health of environment in the reduced and full models (OR = .67, p<.01; OR = .66, p<.01). Thus, in the full model Republicans are .66 times *less* likely than non-Republicans to *agree* that economic progress is dependent on the health of environment is dependent on the improvement of environmental conditions. The effect size of the regression coefficient for Republican increases slightly between the reduced model (b = -.397) and the full model (b = -.422) indicating the possibility of an interaction between Republican and another socio-demographic variable.

Likelihood of Damage from a Nuclear Accident

Table 6.16 displays the results of the logistic regression models predicting GSS survey respondents' answer to the following question: How likely is it that an accident at a nuclear power station will cause long-term environmental damage across many countries? Being a man is a negative predictor of likelihood of damage from a nuclear accident in the reduced and full models (OR = .63, p<.001; OR = .62, p<.01) such that men are .62 times *less* likely than women to believe that damage from a nuclear accident will cause long-term damage across many countries. Similarly white (OR = .60, p<.01; OR = .52, p<.01), years of education (OR = .93, p<.01; OR = .93, p<.01), and Republican (OR = .69, p<.05; OR = .71, p<.05) are all negative predictors of likelihood of damage from a nuclear accident model. For example, in the full model Republicans are .71 times *less* likely than non-Republicans to be concerned about the possibility of damage from a wide-scale nuclear accident. In addition, the effect size of the regression coefficient for white increases slightly between the reduced model (b = -.512) and the full model (b = -.649) indicating the possibility of a moderated relationship.

Furthermore, residing in an urban setting is not a significant predictor of concern for a nuclear accident; however, given the disproportionate location of nuclear facilities in rural areas it might be assumed that non-urban residents would display greater levels of concern about damage from a nuclear facility than urban residents. Since interactions have moderating effects on the relationship between the dependent variable and an independent variable of interest and may make the independent variable seem less significant than it actually is, perhaps there is an interaction effect present between being a man and residing in urban settings, making the relationship between urban and likelihood of damage from a nuclear accident seem less significant than it actually is.

I Help the Environment

Table 6.17 displays the results of the ordered logistic regression models predicting GSS survey respondents' agreement with the following statement: I do what is right for the environment, even when it costs more money or takes up more time. Male is not a significant predictor of I help the environment. Age (OR = 1.02, p<.001; OR = 1.02, p<.001), years of education (OR = 1.08, p<.001; OR = 1.09, p<.001), and belief in evolution (OR = 1.33, p<.05) are all positive predictors of I help the environment such that those who believe in evolution, for example, are 1.33 times *more* likely than those who do not believe in evolution to self report helping the environment despite the sacrifice of time or money. The effect size of the regression coefficient for years of education increases slightly between the reduced model (b = .078) and the full model (b = .087) suggesting the possibility of an interaction between years of education and another socio-demographic variable. Being white is a negative predictor of I help the environment in the reduced model (OR = .74, p<.05) but the effect becomes non-

significant in the full model indicating the possibility of a mediated relationship. And residing in urban settings is not a significant predictor of I help the environment in the reduced model but becomes a negative predictor of I help the environment in the full model (OR = .75, p<.05) suggesting the possibility of a moderated relationship.

Feelings toward Environmentalists

Table 6.18 specifically displays the results of the multivariate OLS regression models predicting respondents' feelings toward environmentalists. The higher the number (on a scale of 0 to 100) the more favorable a respondent feels toward environmentalists. Men (b = -5.786, p<.001; b = -6.000, p<.001), whites (b = -8.274, p<.001; b = -8.433, p<.001), and ratings on the Republican thermometer (b = -.072, p<.001; b = -.070, p<.001) are all negative predictors of feelings toward environmentalists. Thus, for example men are *less* likely than women to feel favorable toward environmentalists. In addition, the effect size of the regression coefficients for both men and whites increases slightly between the reduced and full models indicating the potential for interaction effects. Educational attainment is a positive predictor of feelings toward environmentalists in the reduced model (b = .688, p<.05) and the full model (b = .729, p<.05) with a slight increase in effect size between the two models, also indicating the possibility of a moderated relationship.

Lower Power Plant Emissions

Table 6.19 displays the results of the ordered logistic regression models predicting respondents' favorability toward government restrictions on the greenhouse gas emissions of power plants in an effort to reduce global warming. Gender is not a significant predictor of lower power plant emissions. Race (OR = 1.43, p<.05; OR =

1.46, p<.05) and educational attainment (OR = 1.10, p<.05; OR = 1.10, p<.05) are positive predictors of low emissions such that whites are 1.46 times *more* likely than non-whites to favor government restrictions on power plant emissions. The effect size of the regression coefficient associated with race increases between the reduced model (b = .359) and the full model (b = .377) suggesting the possibility of an interaction between race and another socio-demographic variable. The Republican feeling thermometer is a negative predictor of lower power plant emissions in the reduced model (OR = .99, p<.05) as well as the full model (OR = .99, p<.05) indicating that with every one unit increase in favorability towards the Republican Party respondents are .99 times *less* likely to favor government restrictions on power plant emissions. Interestingly, residing in an urban setting is not a significant predictor of support for increased government restrictions on power plant emissions.

Support for Gas Tax

Table 6.20 displays the results of the ordered logistic regression models predicting respondents' favorability toward increasing taxes on gasoline so that people will either drive less or buy cars that use less gas. Gender is not a significant predictor of support for gas tax. Neither class status nor having a religious affiliation (versus not) are significant predictors of support for gas tax in the reduced models yet both become negative predictors of support for gas tax in the full models (lower and working class OR = .74, p<.05; religious OR = .56, p<.01). In the full model those who have a religious affiliation are .56 times *less* likely to favor an increase in gas taxes than those who do not have a religious affiliation. The increase in significance between the reduced

models and full models for lower and working class as well as religious affiliation indicate the potential for multiple interaction effects.

Conclusions

In sum, gender is a significant predictor of six measures of environmental concern in the bivariate reduced models (willingness to pay, reliance on science, growth harms the environment, progress is dependent on the health of environment, likelihood of damage from a nuclear accident, and feelings toward environmentalists) yet in the multivariate analysis gender is a significant predictor of only four measures of environmental concern in the reduced models (willingness to pay, reliance on science, likelihood of damage from a nuclear accident, and feelings toward environmentalists) and three measures of environmental concern in the full models (reliance on science, likelihood of damage from a nuclear accident, and feelings toward environmentalists).

Based on the multivariate regression models, I expect to find significant interaction effects between gender and one or more socio-demographic variables for both willingness to pay and feelings toward environmentalists models. For willingness to pay the direction of significance is the opposite of what previous literature documents, being a man is a positive predictor for willingness to pay for environmental protection (versus being a woman) yet it is expected for men to have less environmental concern. This indicates the likelihood of a significant interaction effect. Furthermore, for feelings toward environmentalists model the effect size of the regression coefficient for gender increases between the reduced and full models, again signifying the potential for an interaction effect between gender and at least one other socio-demographic variable. In

addition, since gender is a significant predictor of environmental concern in only three of fourteen full models (reliance on science, likelihood of damage from a nuclear accident, and feelings toward environmentalists) yet previous literature suggest that gender is a predictor of environmental concern, interaction effects are likely present making it appear as if gender is non-significant. As discussed extensively in Chapter Two and Chapter Three, there are also theoretical reasons to expect interaction effects between gender and various socio-demographic variables, such as the differences in education received between men and women.

It should be noted that overall the percent of variance explained is small for all the OLS regression models; the highest Adjusted R^2 (.130) is found in the reduced model of opportunity cost. A small percent of variance explained is not unexpected in environmental values research; nevertheless it does indicate that these models are not as well specified as they could be.

CHAPTER SEVEN

MODERATING EFFECTS OF GENDER AND DEMOGRAPHIC CHARACTERISTICS OF ENVIRONMENTAL CONCERN

The third analytical section of my dissertation, addresses research questions four and five using statistical techniques to test for interaction effects:

(4) Are there moderating effects between gender and socio-demographic factors with regard to environmental concern?

(5) If there are mediating and moderating effects, are they consistent across a variety of datasets using different samples and different measures of environmental concern?

My study is exploratory in nature, thus I do not have specific hypotheses about the direction of the interaction effects. I do expect to find multiple significant interaction effects between gender and various socio-demographic variables (age, race, class, education, political party identification, place of residence, marital status, number of children, religious identification, and belief in or knowledge about science). I expect that the relationships between socio-demographic variables and environmental concern are more complex than previous research indicates, since our lived experiences lie at the intersection of multiple socio-demographic identities (e.g., one might be a white woman who lives in a rural area and is Protestant and Republican).

According to Singleton and Straits (2005) an interaction effect is "an outcome in which the effect of one independent variable varies according to the value or level of another independent variable. That is, the effects of the variables together differ from the effects of either alone" (p. 564). So I predict that the effect of various independent

variables will vary according to gender on environmental concern. Another way of explaining interaction effects, using education as an example, is to say that the rate at which increases in education are associated to changes in environmental concern is different for men and women. Graphs of interaction effects using interval level data are common visual representations of different regression slopes across groups, as graphing gives a clearer interpretation of interactions than mere regression coefficients.

The data used to test the research questions about interactions are from the General Social Survey (GSS) Environment II: 2000 questionnaire and the American National Election Study (ANES) 2008 Time Series Pre-election Survey. As there are multiple means by which environmental concern can be measured, there are a total of thirty-one potential dependent variables across the two datasets representing various measures of environmental concern. The variable of interest is gender and its moderators/ mediators (age, race, class, education, political party identification, residence, marital status, number of children, religious identification, and belief in science or knowledge about science). First I conducted principle component analysis (PCA), a type of exploratory factor analysis, to determine whether and which environmental concern indicators are measuring the same underlining construct (factor) and need to be scaled together (Hamilton 2006). Based on the results of the PCA, I created three composite variables that combine fifteen of the twenty-six dependent variables leaving me with fourteen dependent variables. See Chapter Four for a complete discussion of data and methods, including results of the PCA.

In this chapter, I discuss the results of various analyses using both linear regression and non-parametric techniques according to what was appropriate for each

dependent variable. Model building techniques are frequently used for the purpose of indentifying potential mediating and moderating effects. See Chapter Four for a complete discussion of methodology used, including model building techniques and details for creating interaction terms. The results for each interaction model are presented in this chapter - descriptive statistics, bivariate results, and multivariate (non-moderated) results were presented in the previous chapter.

Results

Interaction Models

Turning now to the central objective of this dissertation: to assess moderating effects of gender and socio-demographic variables on various measures of environmental concern. Interaction terms were created between gender and the other ten independent variables and each one was run in the full models for all fourteen measures of environmental concern. See Chapter Four for a complete discussion of creating interaction terms. Tables 7.1a through 7.14b display the results of the interaction terms. Tables 7.1a through 7.11c are models from the GSS dataset and tables 7.12a through 7.14b are models from the ANES dataset. The number of respondents for each cell in the categorical interaction terms is displayed in parenthesis in the first column of each table. Tables 7.15 (GSS dataset) and 7.16 (ANES dataset) are particularly useful as they display a summary of all the interaction terms in all models.

Table 7.1a OLS Regression Interaction Models of Willingness to Pay

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.068	.055					.067	.055
Age (centered)	(-.003)	.002	-.001	.002	-.001	.002	-.001	.002
White	.068	.070			.061	.070	.061	.071
Low class	-.198 ***	.056	-.196 **	.056			-.197 ***	.056
Years of education (centered)	.027 **	.010	.028 **	.010	.029 **	.010	(.034) *	.014
Republican	-.207 **	.063	-.204 **	.063	-.198 **	.063	-.204 **	.063
Reside in urban setting	-.011	.055	-.011	.055	-.011	.055	-.012	.055
Ever been married	-.117	.071	-.118	.072	-.117	.071	-.116	.071
Number of children (centered)	-.018	.019	-.017	.019	-.016	.019	-.017	.019
Religious	-.114	.081	-.115	.081	-.118	.081	-.116	.081
Believe in evolution	.076	.057	.078	.057	.077	.057	.079	.057
Male x centered age	.003	.003						
Male x white (n=997)			.139	.093				
Male x non-white (n=232)			.101	-.101				
Female x white (n=1216)			.085	.090				
Female x non-white (n=372)			REFERENCE					
Male x low class (n=615)					.137	.078		
Male x not low class (n=608)					**.253 **	**.079**		
Female x low class (n=807)					REFERENCE			
Female x not low class (n=773)					**.259 ***	**.074**		
Male X centered years of education							-.011	.019
Adjusted R^2	.048		.047		.049		.047	
N	1001		1001		1001		1001	

* p<.05 ** p<.01 *** p<.001

Table 7.1b OLS Regression Interaction Models of Willingness to Pay

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	-.001	.002	-.001	.002	-.001	.002
White	.067	.070	.066	.070	.061	.071
Low class	-.194 **	.056	-.197 **	.056	-.196 **	.056
Years of education (centered)	.028 **	.010	.028 **	.010	.029 **	.010
Republican			-.206 **	.063	-.204 **	.063
Reside in urban setting	-.010	.055			-.013	.055
Ever been married	-.114	.071	-.116	.071		
Number of children (centered)	-.018	.019	-.018	.019	-.016	.019
Religious	-.116	.081	-.115	.081	-.116	.081
Believe in evolution	.078	.057	.077	.057	.079	.057
Male x Republican (n=349)	.134	.103				
Male x not Republican (n=880)	**.290 **	**.092**				
Female x Republican (n=335)	REFERENCE					
Female x not Republican (n=1253)	**.253 **	**.087**				
Male x urban (n=242)			.042	.082		
Male x not urban (n=291)			.075	.078		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.006	.073		
Male x ever been married (n=867)					-.161	.098
Male x not ever been married (n=361)					REFERENCE	
Female x ever been married (n=1237)					**-.203 *	**.098**
Female x not ever been married (n=351)					-.126	.108
Adjusted R^2	.048		.047		.047	
N	1001		1001		1001	

* p<.05 ** p<.01 *** p<.001

Table 7.1c OLS Regression Interaction Models of Willingness to Pay

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.063	.055				
Age (centered)	-.001	.002	-.001	.002	-.001	.002
White	.066	.070	.064	.070	.068	.070
Low class	-.196 **	.056	-.197 ***	.056	-.196 **	.056
Years of education (centered)	.029 **	.010	.028 **	.010	.028 **	.010
Republican	-.205 **	.063	-.206 **	.063	-.208 **	.063
Reside in urban setting	-.014	.056	-.011	.055	-.011	.055
Ever been married	-.111	.072	-.112	.071	-.115	.071
Number of children (centered)	(-.010)	.024	-.019	.019	-.017	.019
Religious	-.112	.081			-.118	.081
Believe in evolution	.078	.057	.077	.057		
Male x centered number of children	-.020	.033				
Male x religious (n=1006)			.088	.059		
Male x not religious (n=221)			.125	.105		
Female x religious (n=1409)			REFERENCE			
Female x not religious (n=177)			.218	.122		
Male x believe in evolution (n=249)					.023	.083
Male x not believe in evolution (n=236)					REFERENCE	
Female x believe in evolution (n=257)					.009	.082
Female x not believe in evolution (n=353)					-.111	.076
Adjusted R^2	.047		.048		.048	
N	1001		1001		1001	

* p<.05 ** p<.01 *** p<.001

Table 7.2a OLS Regression Interaction Models of Environmental Problems are Dangerous

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.022	.048					-.015	.048
Age (centered)	(-.004)	.002	-.004 *	.002	-.004 *	.002	-.003 *	.002
White	-.073	.061			-.077	.061	-.088	.061
Low class	-.018	.049	-.016	.049			-.020	.049
Years of education (centered)	.005	.009	.003	.009	.006	.009	(.022)	.012
Republican	-.222 ***	.055	-.215 ***	.055	-.217 ***	.055	-.220 ***	.055
Reside in urban setting	.079	.048	.080	.048	.080	.048	.079	.048
Ever been married	-.014	.062	-.032	.062	-.014	.062	-.012	.062
Number of children (centered)	.002	.017	.007	.017	.003	.017	.006	.017
Religious	-.147 *	.071	-.146 *	.070	-.150 *	.071	-.151	.070
Believe in evolution	.070	.049	.079	.049	.070	.049	.076	.049
Male x centered age	-.0005	.003						
Male x white (n=997)			**-.290 ** .089**					
Male x non-white (n=232)			REFERENCE					
Female x white (n=1216)			**-.187 * .088**					
Female x non-white (n=372)			**-.276 ** .103**					
Male x low class (n=615)					.040	.067		
Male x not low class (n=608)					-.013	.069		
Female x low class (n=807)					REFERENCE			
Female x not low class (n=773)					.073	.064		
Male X centered years of education							**-.036 * .016**	
Adjusted R^2	.036		.046		.037		.040	
N	1033		1033		1033		1033	

* p<.05 ** p<.01 *** p<.001

Table 7.2b OLS Regression Interaction Models of Environmental Problems are Dangerous

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	-.004 *	.002	-.004 *	.002	-.004 *	.002
White	-.074	.061	-.074	.061	-.075	.061
Low class	-.019	.049	-.017	.049	-.017	.049
Years of education (centered)	.005	.009	.005	.009	.005	.009
Republican			-.222 ***	.055	-.221 ***	.055
Reside in urban setting	.078	.048			.079	.048
Ever been married	-.015	.062	-.013	.062		
Number of children (centered)	.002	.017	.002	.017	.002	.017
Religious	-.147 *	.071	-.147 *	.071	-.147 *	.071
Believe in evolution	.070	.049	.070	.049	.071	.049
Male x Republican (n=349)	REFERENCE					
Male x not Republican (n=880)	**.254 **	**.076**				
Female x Republican (n=335)	.069	.090				
Female x not Republican (n=1253)	**.259 ***	**.073**				
Male x urban (n=242)			-.028	.072		
Male x not urban (n=291)			-.102	.068		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.083	.064		
Male x ever been married (n=867)					-.025	.085
Male x not ever been married (n=361)					REFERENCE	
Female x ever been married (n=1237)					.004	.085
Female x not ever been married (n=351)					.007	.094
Adjusted R^2	.036		.036		.036	
N	1033		1033		1033	

* p<.05 ** p<.01 *** p<.001

Table 7.2c OLS Regression Interaction Models of Environmental Problems are Dangerous

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.022	.048				
Age (centered)	-.004 *	.002	-.004 *	.002	-.004 *	.002
White	-.075	.061	-.074	.061	-.071	.061
Low class	-.017	.049	-.018	.049	-.016	.049
Years of education (centered)	.004	.009	.005	.009	.006	.009
Republican	-.221 ***	.055	-.222 ***	.055	-.224 ***	.055
Reside in urban setting	.084	.048	.079	.048	.080	.048
Ever been married	-.023	.062	-.012	.062	-.013	.062
Number of children (centered)	(-.012)	.020	.002	.017	.003	.017
Religious	-.151 *	.071			-.150 *	.071
Believe in evolution	.069	.049	.070	.049		
Male x centered number of children	.034	.029				
Male x religious (n=1006)			-.014	.051		
Male x not religious (n=221)			.105	.091		
Female x religious (n=1409)			REFERENCE			
Female x not religious (n=177)			.186	.107		
Male x believe in evolution (n=249)					.016	.072
Male x not believe in evolution (n=236)					REFERENCE	
Female x believe in evolution (n=257)					.090	.070
Female x not believe in evolution (n=353)					-.024	.066
Adjusted R^2	.037		.036		.037	
N	1033		1033		1033	

* p<.05 ** p<.01 *** p<.001

Table 7.3a OLS Regression Interaction Models of Opportunity Cost

	Male x Centered Age			Male x White			Male x Low Class			Male x Centered Years of Education		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	-.072		.040							-.070		.040
Age (centered)	(-.005)	**	.002	-.005	**	.001	-.005	**	.001	-.005	**	.001
White	.288	***	.051				.289	***	.051	.283	***	.051
Low class	-.053		.041	-.052		.041				-.053		.041
Years of education (centered)	.051	***	.007	.051	***	.007	.051	***	.007	(.057)	***	.010
Republican	-.142	**	.046	-.141	**	.046	-.142	**	.046	-.141	**	.046
Reside in urban setting	.025		.040	.025		.040	.025		.040	.025		.040
Ever been married	.005		.052	.004		.052	.005		.052	.005		.052
Number of children (centered)	-.029	*	.014	-.029	*	.014	-.029	*	.014	-.027	*	.014
Religious	-.133	*	.059	-.133	*	.059	-.133	*	.059	-.135	*	.059
Believe in evolution	.028		.041	.029		.041	.028		.041	.030		.041
Male x centered age	.000		.002									
Male x white (n=997)				**.280**	*******	**.075**						
Male x non-white (n=232)				REFERENCE								
Female x white (n=1216)				**.355**	*******	**.074**						
Female x non-white (n=372)				.061		.086						
Male x low class (n=615)							REFERENCE					
Male x not low class (n=608)							.059		.060			
Female x low class (n=807)							.078		.056			
Female x not low class (n=773)							**.126**	*****	**.058**			
Male X centered years of education										-.013		.014
Adjusted R^2	.128			.129			.129			.129		
N	1043			1043			1043			1043		

* p<.05 ** p<.01 *** p<.001

Table 7.3b OLS Regression Interaction Models of Opportunity Cost

	Male x Republican			Male x Reside in Urban Setting			Male x Ever Been Married		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male									
Age (centered)	-.005	**	.001	-.005	**	.001	-.005	**	.001
White	.289	***	.051	.289	***	.051	.285	***	.051
Low class	-.050		.041	-.053		.041	-.052		.041
Years of education (centered)	.051	***	.007	.051	***	.007	.051	***	.007
Republican				-.143	**	.046	-.142	**	.046
Reside in urban setting	.027		.040				.024		.040
Ever been married	.007		.052	.005		.052			
Number of children (centered)	-.029	*	.014	-.029	*	.014	-.028	*	.014
Religious	-.134	*	.059	-.133	*	.059	-.134	*	.059
Believe in evolution	.029		.041	.029		.041	.029		.041
Male x Republican (n=349)	**-.194**	****	**.061**						
Male x not Republican (n=880)	**-.097**	*****	**.047**						
Female x Republican (n=335)	**-.186**	****	**.064**						
Female x not Republican (n=1253)	REFERENCE								
Male x urban (n=242)				-.099		.060			
Male x not urban (n=291)				-.098		.057			
Female x urban (n=288)				REFERENCE					
Female x not urban (n=386)				-.046		.053			
Male x ever been married (n=867)							-.034		.071
Male x not ever been married (n=361)							REFERENCE		
Female x ever been married (n=1237)							.057		.071
Female x not ever been married (n=351)							.019		.079
Adjusted R^2	.129			.129			.129		
N	1043			1043			1043		

* p<.05 ** p<.01 *** p<.001

Table 7.3c OLS Regression Interaction Models of Opportunity Cost

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.072	.040				
Age (centered)	-.005 **	.001	-.005 **	.001	-.005 **	.001
White	.287 ***	.051	.288 ***	.051	.290 ***	.051
Low class	-.052	.041	-.053	.041	-.052	.041
Years of education (centered)	.049 ***	.007	.051 ***	.007	.051 ***	.007
Republican	-.141 **	.046	-.142 **	.046	-.144 **	.046
Reside in urban setting	.030	.040	.025	.040	.026	.040
Ever been married	-.005	.052	.006	.052	.005	.052
Number of children (centered)	(-.043) *	.017	-.029 *	.014	-.028 *	.014
Religious	-.137 *	.059			-.135 *	.059
Believe in evolution	.027	.041	.028	.041		
Male x centered number of children	.035	.024				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			.120	.077		
Female x religious (n=1409)			.069	.043		
Female x not religious (n=177)			**.219 ***	**.091**		
Male x believe in evolution (n=249)					-.015	.060
Male x not believe in evolution (n=236)					REFERENCE	
Female x believe in evolution (n=257)					.098	.059
Female x not believe in evolution (n=353)					.035	.055
Adjusted R^2	.130		.129		.129	
N	1043		1043		1043	

* p<.05 ** p<.01 *** p<.001

Table 7.4a Ordered Logistic Regression Interaction Models of Reliance on Science

	Male x Centered Age		Male x White		Male x Lower Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.423 **	.128					-.429 **	.127
Age (centered)	(.008)	.005	.011 *	.004	.011 *	.004	.012 **	.005
White	.125	.161			.115	.161	.084	.161
Low class	-.022	.130	-.020	.130			-.022	.130
Years of education (centered)	.087 ***	.024	.087 ***	.024	.090 ***	.024	(.141) ***	.034
Republican	.112	.146	.120	.146	.128	.147	.125	.147
Reside in urban setting	.026	.128	.026	.128	.025	.128	.024	.128
Ever been married	-.154	.165	-.170	.166	-.156	.165	-.158	.165
Number of children (centered)	.012	.044	.017	.044	.016	.044	.024	.045
Religious	-.091	.183	-.085	.183	-.091	.183	-.088	.183
Believe in evolution	-.231	.129	-.223	.129	-.226	.129	-.218	.130
Male x centered age	.008	.008						
Male x white (n=997)			REFERENCE					
Male x non-white (n=232)			.047	.237				
Female x white (n=1216)			**.504 ***	**.142**				
Female x non-white (n=372)			.259	.212				
Male x low class (n=615)					.132	.189		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					**.443 ***	**.179**		
Female x not low class (n=773)					**.582 ****	**.180**		
Male X centered years of education							**-.103 ***	**.045**
Pseudo R^2	.020		.020		.020		.022	
N	965		965		965		965	

* p<.05 ** p<.01 *** p<.001

Table 7.4b Ordered Logistic Regression Interaction Models of Reliance on Science

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	.012 *	.004	.012 *	.004	.012 **	.004
White	.118	.161	.121	.160	.139	.162
Low class	-.025	.130	-.020	.130	-.019	.130
Years of education (centered)	.089 ***	.024	.089 ***	.024	.087 ***	.024
Republican			.108	.147	.116	.146
Reside in urban setting	.017	.128			.028	.128
Ever been married	-.158	.165	-.149	.165		
Number of children (centered)	.015	.044	.011	.044	.008	.044
Religious	-.087	.183	-.089	.183	-.083	.183
Believe in evolution	-.231	.129	-.229	.129	-.233	.129
Male x Republican (n=349)	**-.611 ***	**.244**				
Male x not Republican (n=880)	**-.610 ****	**.212**				
Female x Republican (n=335)	REFERENCE					
Female x not Republican (n=1253)	-.227	.202				
Male x urban (n=242)			**-.543 ****	**.189**		
Male x not urban (n=291)			**-.469 ***	**.181**		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.103	.170		
Male x ever been married (n=867)					**-.662 ****	**.215**
Male x not ever been married (n=361)					**-.682 ****	**.246**
Female x ever been married (n=1237)					-.302	.213
Female x not ever been married (n=351)					REFERENCE	
Pseudo R^2	.020		.020		.020	
N	965		965		965	

* p<.05 ** p<.01 *** p<.001

Table 7.4c Ordered Logistic Regression Interaction Models of Reliance on Science

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.441 ***	.126				
Age (centered)	.012 *	.004	.012 *	.004	.012 *	.004
White	.120	.161	.113	.161	.127	.161
Low class	-.018	.130	-.022	.130	-.019	.130
Years of education (centered)	.088 ***	.024	.088 ***	.024	.090 ***	.024
Republican	.115	.146	.117	.146	.110	.146
Reside in urban setting	.029	.128	.026	.128	.025	.128
Ever been married	-.162	.166	-.136	.165	-.151	.165
Number of children (centered)	(-.002)	.055	.010	.044	.015	.044
Religious	-.093	.183			-.098	.183
Believe in evolution	-.230	.129	-.228	.129		
Male x centered number of children	.038	.077				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			-.087	.233		
Female x religious (n=1409)			**.383 **	**.135**		
Female x not religious (n=177)			**.743 *	**.297**		
Male x believe in evolution (n=249)					REFERENCE	
Male x not believe in evolution (n=236)					**.393 *	**.189**
Female x believe in evolution (n=257)					**.598 **	**.181**
Female x not believe in evolution (n=353)					**.693 ***	**.176**
Pseudo R^2	.020		.021		.021	
N	965		965		965	

* p<.05 ** p<.01 *** p<.001

Table 7.5a Ordered Logistic Regression Interaction Models of Modern Life Harms the Environment

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.071	.125					.073	.125
Age (centered)	(-.006)	.005	-.010 *	.004	-.010 *	.004	-.010 *	.004
White	.000	.159			.001	.159	.026	.160
Low class	.138	.128	.132	.128			.138	.128
Years of education (centered)	-.060 **	.023	-.067 **	.023	-.062 **	.023	(-.085) **	.031
Republican	-.423 **	.142	-.416 **	.142	-.418 **	.142	-.430 **	.142
Reside in urban setting	.069	.125	.078	.125	.070	.125	.071	.125
Ever been married	-.072	.161	-.111	.162	-.076	.161	-.076	.161
Number of children (centered)	.015	.043	.020	.043	.014	.043	.009	.043
Religious	.012	.185	.023	.186	.005	.186	.015	.185
Believe in evolution	.185	.127	.199	.128	.182	.127	.178	.127
Male x centered age	-.009	.008						
Male x white (n=997)			-.322	.239				
Male x non-white (n=232)			REFERENCE					
Female x white (n=1216)			-.291	.233				
Female x non-white (n=372)			**-.540 ***	**.274**				
Male x low class (n=615)					.256	.190		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					.061	.178		
Female x not low class (n=773)					.017	.173		
Male X centered years of education							.048	.043
Pseudo R^2	.018		.019		.017		.017	
N	987		987		987		987	

* p<.05 ** p<.01 *** p<.001

Table 7.5b Ordered Logistic Regression Interaction Models of Modern Life Harms the Environment

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	-.010 *	.004	-.010 *	.004	-.010 *	.004
White	.005	.159	.002	.159	-.005	.160
Low class	.138	.128	.134	.128	.134	.128
Years of education (centered)	-.062 **	.023	-.063 **	.023	-.061 **	.023
Republican			-.420 **	.142	-.427 **	.141
Reside in urban setting	.074	.125			.066	.125
Ever been married	-.070	.161	-.073	.161		
Number of children (centered)	.011	.043	.015	.043	.015	.043
Religious	.010	.185	.011	.185	.010	.185
Believe in evolution	.185	.127	.184	.127	.187	.127
Male x Republican (n=349)	.180	.230				
Male x not Republican (n=880)	**.539 **	**.205**				
Female x Republican (n=335)	REFERENCE					
Female x not Republican (n=1253)	**.490 *	**.192**				
Male x urban (n=242)			.189	.187		
Male x not urban (n=291)			.016	.176		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			.007	.164		
Male x ever been married (n=867)					.046	.207
Male x not ever been married (n=361)					.215	.245
Female x ever been married (n=1237)					.002	.204
Female x not ever been married (n=351)					REFERENCE	
Pseudo R^2	.017		.017		.017	
N	987		987		987	

* p<.05 ** p<.01 *** p<.001

Table 7.5c Ordered Logistic Regression Interaction Models of Modern Life Harms the Environment

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.084	.124				
Age (centered)	-.010 *	.004	-.010 *	.004	-.010 *	.004
White	.006	.159	-.002	.159	.006	.159
Low class	.135	.128	.129	.128	.134	.128
Years of education (centered)	-.060 **	.023	-.063 **	.023	-.062 **	.023
Republican	-.423 **	.141	-.427 **	.141	-.428 **	.142
Reside in urban setting	.058	.125	.071	.125	.071	.125
Ever been married	-.053	.162	-.066	.161	-.074	.161
Number of children (centered)	(.044)	.052	.009	.043	.012	.043
Religious	.023	.186			.011	.185
Believe in evolution	.188	.127	.181	.127		
Male x centered number of children	-.082	.076				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			-.163	.239		
Female x religious (n=1409)			-.135	.133		
Female x not religious (n=177)			.069	.291		
Male x believe in evolution (n=249)					REFERENCE	
Male x not believe in evolution (n=236)					-.170	.188
Female x believe in evolution (n=257)					-.075	.177
Female x not believe in evolution (n=353)					-.268	.172
Pseudo R^2	.017		.017		.017	
N	987		987		987	

* p<.05 ** p<.01 *** p<.001

Table 7.6a Ordered Logistic Regression Interaction Models of Economic Growth Protects the Environment

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.040	.126					.020	.126
Age (centered)	(-.002)	.005	-.005	.004	-.005	.004	-.004	.004
White	.394 *	.161			.387 *	.161	.351 *	.162
Low class	-.049	.128	-.045	.128			-.062	.128
Years of education (centered)	.041	.023	.036	.023	.041	.023	(.105) **	.032
Republican	-.195	.144	-.189	.144	-.182	.144	-.198	.144
Reside in urban setting	-.026	.125	-.018	.125	-.023	.125	-.032	.125
Ever been married	-.035	.161	-.083	.163	-.048	.161	-.039	.161
Number of children (centered)	-.004	.043	.003	.044	-.002	.043	.008	.044
Religious	-.132	.181	-.121	.181	-.135	.181	-.133	.181
Believe in evolution	-.123	.128	-.107	.128	-.119	.128	-.096	.128
Male x centered age	-.007	.008						
Male x white (n=997)			**.512 ***	**.215**				
Male x non-white (n=232)			.483	.278				
Female x white (n=1216)			**.665 ****	**.208**				
Female x non-white (n=372)			REFERENCE					
Male x low class (n=615)					.148	.189		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					.001	.178		
Female x not low class (n=773)					.202	.175		
Male X centered years of education							**-.137 ****	**.045**
Pseudo R^2	.007		.009		.008		.012	
N	964		964		964		964	

* p<.05 ** p<.01 *** p<.001

Table 7.6b Ordered Logistic Regression Interaction Models of Economic Growth Protects the Environment

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	-.005	.004	-.005	.004	-.005	.004
White	.398 *	.161	.411 *	.161	.425 **	.162
Low class	-.052	.128	-.054	.128	-.053	.128
Years of education (centered)	.039	.023	.039	.023	.037	.023
Republican			-.223	.145	-.201	.144
Reside in urban setting	-.025	.125			-.014	.125
Ever been married	-.040	.161	-.041	.161		
Number of children (centered)	-.005	.043	-.013	.043	-.011	.043
Religious	-.129	.181	-.132	.181	-.128	.181
Believe in evolution	-.124	.128	-.128	.128	-.128	.128
Male x Republican (n=349)	REFERENCE					
Male x not Republican (n=880)	.243	.203				
Female x Republican (n=335)	.091	.237				
Female x not Republican (n=1253)	.246	.194				
Male x urban (n=242)			-.343	.186		
Male x not urban (n=291)			-.002	.176		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.226	.165		
Male x ever been married (n=867)					-.133	.206
Male x not ever been married (n=361)					-.292	.241
Female x ever been married (n=1237)					-.201	.204
Female x not ever been married (n=351)					REFERENCE	
Pseudo R^2	.007		.009		.008	
N	964		964		964	

* p<.05 ** p<.01 *** p<.001

Table 7.6c Ordered Logistic Regression Interaction Models of Economic Growth Protects the Environment

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.025	.125				
Age (centered)	-.005	.004	-.004	.004	-.005	.004
White	.400 *	.161	.393 *	.161	.395 *	.161
Low class	-.048	.128	-.052	.128	-.049	.128
Years of education (centered)	.038	.024	.039	.023	.039	.023
Republican	-.199	.144	-.198	.144	-.194	.144
Reside in urban setting	-.017	.125	-.021	.125	-.023	.124
Ever been married	-.048	.162	-.028	.161	-.038	.161
Number of children (centered)	(-.020)	.053	-.009	.043	-.007	.043
Religious	-.135	.181			-.127	.181
Believe in evolution	-.125	.128	-.124	.128		
Male x centered number of children	.036	.076				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			-.070	.237		
Female x religious (n=1409)			-.039	.134		
Female x not religious (n=177)			.363	.277		
Male x believe in evolution (n=249)					REFERENCE	
Male x not believe in evolution (n=236)					.059	.189
Female x believe in evolution (n=257)					-.031	.178
Female x not believe in evolution (n=353)					.142	.173
Pseudo R^2	.007		.008		.007	
N	964		964		964	

* p<.05 ** p<.01 *** p<.001

Table 7.7a Ordered Logistic Regression Interaction Models of Growth Harms the Environment

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.226	.130					-.176	.127
Age (centered)	(.006)	.005	-.002	.004	-.002	.004	-.002	.004
White	-.419 **	.160			-.404 *	.160	-.377 *	.161
Low class	.005	.130	-.001	.130			.004	.130
Years of education (centered)	-.148 ***	.024	-.159 ***	.025	-.150 ***	.024	(-.176) ***	.033
Republican	-.217	.147	-.215	.147	-.221	.148	-.240	.147
Reside in urban setting	.045	.127	.062	.127	.046	.127	.051	.127
Ever been married	-.156	.163	-.227	.164	-.174	.163	-.165	.163
Number of children (centered)	-.019	.045	-.013	.045	-.022	.045	-.029	.045
Religious	-.053	.186	-.046	.186	-.062	.185	-.054	.185
Believe in evolution	.105	.129	.127	.130	.102	.129	.092	.129
Male x centered age	**-.023 **	**.008**						
Male x white (n=997)			**-.978 ***	**.241**				
Male x non-white (n=232)			REFERENCE					
Female x white (n=1216)			**-.594 *	**.235**				
Female x non-white (n=372)			**-.600 *	**.271**				
Male x low class (n=615)					.161	.194		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					.193	.183		
Female x not low class (n=773)					.313	.181		
Male X centered years of education							.052	.046
Pseudo R^2	.038		.039		.035		.035	
N	976		976		976		976	

* p<.05 ** p<.01 *** p<.001

Table 7.7b Ordered Logistic Regression Interaction Models of Growth Harms the Environment

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	-.002	.004	-.002	.004	-.002	.004
White	-.396 *	.160	-.393 *	.160	-.415 *	.161
Low class	-.001	.130	.000	.130	.002	.130
Years of education (centered)	-.151 ***	.024	-.152 ***	.024	-.150 ***	.024
Republican			-.240	.147	-.234	.147
Reside in urban setting	.047	.127			.044	.127
Ever been married	-.167	.163	-.166	.163		
Number of children (centered)	-.024	.045	-.026	.045	-.019	.045
Religious	-.058	.185	-.057	.185	-.056	.185
Believe in evolution	.100	.129	.099	.129	.107	.129
Male x Republican (n=349)	REFERENCE					
Male x not Republican (n=880)	.238	.209				
Female x Republican (n=335)	.173	.244				
Female x not Republican (n=1253)	**.405 ***	**.198**				
Male x urban (n=242)			-.239	.188		
Male x not urban (n=291)			-.214	.182		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.102	.167		
Male x ever been married (n=867)					-.280	.210
Male x not ever been married (n=361)					.066	.243
Female x ever been married (n=1237)					-.025	.206
Female x not ever been married (n=351)					REFERENCE	
Pseudo R^2	.034		.034		.035	
N	976		976		976	

* p<.05 ** p<.01 *** p<.001

Table 7.7c Ordered Logistic Regression Interaction Models of Growth Harms the Environment

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.184	.128				
Age (centered)	-.002	.004	-.001	.004	-.002	.004
White	-.403 *	.160	-.401 *	.160	-.395 *	.160
Low class	.000	.130	-.003	.130	.000	.130
Years of education (centered)	-.148 ***	.025	-.152 ***	.024	-.151 ***	.024
Republican	-.230	.147	-.236	.147	-.236	.147
Reside in urban setting	.026	.128	.046	.127	.047	.127
Ever been married	-.120	.165	-.163	.163	-.167	.163
Number of children (centered)	(.034)	.053	-.026	.045	-.024	.045
Religious	-.039	.186			-.059	.185
Believe in evolution	.119	.130	.098	.129		
Male x centered number of children	-.154	.079				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			-.098	.243		
Female x religious (n=1409)			.119	.137		
Female x not religious (n=177)			.386	.284		
Male x believe in evolution (n=249)					REFERENCE	
Male x not believe in evolution (n=236)					-.078	.193
Female x believe in evolution (n=257)					.189	.181
Female x not believe in evolution (n=353)					.073	.177
Pseudo R^2	.036		.035		.034	
N	976		976		976	

* p<.05 ** p<.01 *** p<.001

Table 7.8a Ordered Logistic Regression Interaction Models of Concerned about Population Growth

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.092	.131					.094	.130
Age (centered)	(.009)	.006	.006	.005	.006	.005	.006	.005
White	.387 *	.163			.393 *	.163	.410 *	.164
Low class	-.064	.133	-.069	.133			-.062	.133
Years of education (centered)	-.032	.025	-.035	.025	-.033	.025	(-.055)	.033
Republican	-.373 *	.148	-.372 *	.148	-.379 *	.149	-.380 *	.148
Reside in urban setting	.036	.131	.038	.131	.037	.131	.040	.131
Ever been married	-.035	.169	-.052	.170	-.036	.169	-.039	.169
Number of children (centered)	-.085	.046	-.084	.046	-.088	.046	-.091 *	.046
Religious	-.485 *	.202	-.483 *	.202	-.485 *	.202	-.484 *	.202
Believe in evolution	.590 ***	.134	.595 ***	.134	.589 ***	.134	.581 ***	.134
Male x centered age	-.007	.008						
Male x white (n=997)			**.543 ***	**.216**				
Male x non-white (n=232)			.281	.274				
Female x white (n=1216)			**.488 ***	**.208**				
Female x non-white (n=372)			REFERENCE					
Male x low class (n=615)					-.108	.199		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					-.178	.188		
Female x not low class (n=773)					-.142	.183		
Male X centered years of education							.046	.047
Pseudo R^2	.030		.030		.030		.030	
N	972		972		972		972	

* p<.05 ** p<.01 *** p<.001

Table 7.8b Ordered Logistic Regression Interaction Models of Concerned about Population Growth

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	.006	.005	.007	.005	.006	.005
White	.395 *	.163	.394 *	.163	.388 *	.164
Low class	-.059	.134	-.067	.133	-.066	.133
Years of education (centered)	-.033	.025	-.033	.025	-.033	.025
Republican			-.384 *	.148	-.376 *	.148
Reside in urban setting	.043	.131			.036	.131
Ever been married	-.032	.169	-.038	.169		
Number of children (centered)	-.088	.046	-.090 *	.046	-.086	.046
Religious	-.487 *	.202	-.483 *	.202	-.487 *	.202
Believe in evolution	.592 ***	.134	.587 ***	.134	.591 ***	.134
Male x Republican (n=349)	.271	.239				
Male x not Republican (n=880)	**.525 ***	**.214**				
Female x Republican (n=335)	REFERENCE					
Female x not Republican (n=1253)	**.488 ***	**.201**				
Male x urban (n=242)			-.025	.195		
Male x not urban (n=291)			.069	.187		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.137	.172		
Male x ever been married (n=867)					.083	.217
Male x not ever been married (n=361)					.169	.257
Female x ever been married (n=1237)					-.001	.213
Female x not ever been married (n=351)					REFERENCE	
Pseudo R^2	.030		.030		.030	
N	972		972		972	

* p<.05 ** p<.01 *** p<.001

Table 7.8c Ordered Logistic Regression Interaction Models of Concerned about Population Growth

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.106	.130				
Age (centered)	.006	.005	.006	.005	.006	.005
White	.391 *	.163	.394 *	.163	.395 *	.163
Low class	-.067	.133	-.066	.133	-.067	.133
Years of education (centered)	-.031	.025	-.033	.025	-.033	.025
Republican	-.376 *	.148	-.376 *	.148	-.378 *	.148
Reside in urban setting	.027	.132	.038	.131	.037	.131
Ever been married	-.019	.170	-.040	.169	-.038	.169
Number of children (centered)	(-.060)	.055	-.086	.046	-.086	.046
Religious	-.478 *	.202			-.486 *	.202
Believe in evolution	.594 ***	.134	.590 ***	.134		
Male x centered number of children	-.069	.079				
Male x religious (n=1006)			**-.543 ***	**.270**		
Male x not religious (n=221)			REFERENCE			
Female x religious (n=1409)			**-.633 ***	**.266**		
Female x not religious (n=177)			-.218	.373		
Male x believe in evolution (n=249)					**.683 ***	**.183**
Male x not believe in evolution (n=236)					.144	.172
Female x believe in evolution (n=257)					**.629 ***	**.176**
Female x not believe in evolution (n=353)					REFERENCE	
Pseudo R^2	.030		.030		.030	
N	972		972		972	

* p<.05 ** p<.01 *** p<.001

Table 7.9a Ordered Logistic Regression Interaction Models of Progress is Dependent on the Health of Environment

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.215	.128					-.221	.128
Age (centered)	(.006)	.006	.007	.004	.006	.004	.007	.004
White	-.216	.166			-.220	.166	-.212	.167
Low class	.152	.131	.154	.131			.154	.131
Years of education (centered)	-.029	.024	-.027	.024	-.027	.024	(-.037)	.033
Republican	-.422 **	.146	-.424 **	.146	-.410 **	.146	-.423 **	.146
Reside in urban setting	-.019	.129	-.020	.129	-.020	.129	-.019	.129
Ever been married	-.099	.167	-.093	.168	-.101	.167	-.100	.167
Number of children (centered)	.023	.046	.021	.046	.026	.046	.021	.046
Religious	-.039	.186	-.039	.186	-.044	.186	-.039	.186
Believe in evolution	.062	.132	.057	.132	.064	.132	.058	.132
Male x centered age	.001	.008						
Male x white (n=997)			**-.475 ***	**.223**				
Male x non-white (n=232)			-.352	.281				
Female x white (n=1216)			-.293	.218				
Female x non-white (n=372)			REFERENCE					
Male x low class (n=615)					.292	.191		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					**.382 ***	**.183**		
Female x not low class (n=773)					.343	.179		
Male X centered years of education							.017	.045
Pseudo R^2	.014		.015		.015		.014	
N	948		948		948		948	

* p<.05 ** p<.01 *** p<.001

Table 7.9b Ordered Logistic Regression Interaction Models of Progress is Dependent on the Health of Environment

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	.007	.004	.007	.004	.007	.004
White	-.217	.166	-.216	.166	-.218	.166
Low class	.154	.132	.153	.131	.153	.131
Years of education (centered)	-.028	.024	-.028	.024	-.028	.024
Republican			-.427 **	.146	-.422 **	.146
Reside in urban setting	-.018	.129			-.019	.129
Ever been married	-.098	.167	-.098	.167		
Number of children (centered)	.023	.046	.021	.046	.023	.046
Religious	-.039	.186	-.039	.186	-.040	.186
Believe in evolution	.063	.132	.063	.132	.063	.132
Male x Republican (n=349)	REFERENCE					
Male x not Republican (n=880)	**.401 ***	**.202**				
Female x Republican (n=335)	.187	.236				
Female x not Republican (n=1253)	**.629 ** **	**.192**				
Male x urban (n=242)			-.299	.191		
Male x not urban (n=291)			-.200	.183		
Female x urban (n=288)			REFERENCE			
Female x not urban (n=386)			-.047	.173		
Male x ever been married (n=867)					-.311	.217
Male x not ever been married (n=361)					-.203	.249
Female x ever been married (n=1237)					-.090	.216
Female x not ever been married (n=351)					REFERENCE	
Pseudo R^2	.014		.015		.014	
N	948		948		948	

* p<.05 ** p<.01 *** p<.001

Table 7.9c Ordered Logistic Regression Interaction Models of Progress is Dependent on the Health of Environment

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.208	.128				
Age (centered)	.007	.004	.007	.004	.007	.004
White	-.215	.166	-.218	.166	-.208	.166
Low class	.156	.131	.152	.131	.153	.131
Years of education (centered)	-.031	.024	-.029	.024	-.027	.024
Republican	-.423 **	.146	-.422 **	.146	-.428 **	.146
Reside in urban setting	-.005	.129	-.019	.129	-.016	.129
Ever been married	-.125	.169	-.095	.168	-.097	.167
Number of children (centered)	(-.015)	.055	.022	.046	.024	.046
Religious	-.050	.187			-.044	.187
Believe in evolution	.060	.132	.062	.132		
Male x centered number of children	.097	.079				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			-.010	.242		
Female x religious (n=1409)			.201	.137		
Female x not religious (n=177)			.308	.287		
Male x believe in evolution (n=249)					-.051	.192
Male x not believe in evolution (n=236)					REFERENCE	
Female x believe in evolution (n=257)					.272	.189
Female x not believe in evolution (n=353)					.118	.176
Pseudo R^2	.015		.014		.015	
N	948		948		948	

* p<.05 ** p<.01 *** p<.001

Table 7.10a Logistic Regression Interaction Models of Likelihood of Damage from a Nuclear Accident

	Male x Centered Age		Male x White		Male x Low Class		Male x Centered Years of Education	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.476 **	.140					-.467 **	.141
Age (centered)	(.004)	.006	.006	.005	.006	.005	.006	.005
White	-.649 **	.189			-.646 **	.189	-.667 ***	.190
Low class	.062	.145	.065	.145			.062	.145
Years of education (centered)	-.070 **	.026	-.072 **	.026	-.070 **	.026	(-.049)	.036
Republican	-.340 *	.156	-.333 *	.156	-.344 *	.157	-.335 *	.156
Reside in urban setting	.010	.142	.012	.142	.009	.142	.008	.142
Ever been married	-.139	.186	-.157	.186	-.136	.185	-.133	.186
Number of children (centered)	-.027	.050	-.021	.050	-.028	.050	-.022	.050
Religious	-.241	.209	-.233	.210	-.234	.209	-.242	.210
Believe in evolution	.228	.145	.235	.145	.228	.145	.234	.145
Male x centered age	.005	.009						
Male x white (n=997)			REFERENCE					
Male x non-white (n=232)			**.866 ** .274**					
Female x white (n=1216)			**.553 *** .154**					
Female x non-white (n=372)			**1.017 *** .253**					
Male x low class (n=615)					-.007	.208		
Male x not low class (n=608)					REFERENCE			
Female x low class (n=807)					**.543 ** .203**			
Female x not low class (n=773)					**.417 * .193**			
Male X centered years of education							-.041	.049
Pseudo R^2	.043		.043		.043		.043	
N	918		918		918		918	

* p<.05 ** p<.01 *** p<.001

Table 7.10b Logistic Regression Interaction Models of Likelihood of Damage from a Nuclear Accident

	Male x Republican			Male x Reside in Urban Setting			Male x Ever Been Married		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male									
Age (centered)	.006		.005	.006		.005	.006		.005
White	-.648	**	.189	-.649	**	.189	-.638	**	.189
Low class	.073		.145	.064		.145	.065		.145
Years of education (centered)	-.069	**	.026	-.069	**	.026	-.071	**	.026
Republican				-.335	*	.156	-.336	*	.156
Reside in urban setting	.015		.142				.014		.142
Ever been married	-.131		.186	-.137		.185			
Number of children (centered)	-.027		.050	-.025		.050	-.030		.050
Religious	-.240		.209	-.237		.209	-.237		.209
Believe in evolution	.231		.145	.226		.145	.228		.145
Male x Republican (n=349)	**-.772**	*******	**.208**						
Male x not Republican (n=880)	**-.549**	******	**.167**						
Female x Republican (n=335)	**-.450**	*****	**.217**						
Female x not Republican (n=1253)	REFERENCE								
Male x urban (n=242)				.056		.206			
Male x not urban (n=291)				REFERENCE					
Female x urban (n=288)				**.487**	*****	**.199**			
Female x not urban (n=386)				**.519**	******	**.185**			
Male x ever been married (n=867)							REFERENCE		
Male x not ever been married (n=361)							.011		.245
Female x ever been married (n=1237)							**.419**	******	**.161**
Female x not ever been married (n=351)							**.683**	******	**.249**
Pseudo R^2	.043			.043			.043		
N	918			918			918		

* p<.05 ** p<.01 *** p<.001

Table 7.10c Logistic Regression Interaction Models of Likelihood of Damage from a Nuclear Accident

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.481 **	.140				
Age (centered)	.006	.005	.006	.005	.006	.005
White	-.653 **	.189	-.658 ***	.189	-.649 **	.189
Low class	.068	.145	.060	.145	.065	.145
Years of education (centered)	-.072 **	.026	-.070 **	.026	-.069 **	.026
Republican	-.335 *	.156	-.337 *	.156	-.337 *	.156
Reside in urban setting	.021	.142	.012	.142	.009	.142
Ever been married	-.156	.187	-.130	.186	-.137	.185
Number of children (centered)	(-.057)	.062	-.027	.050	-.026	.050
Religious	-.244	.210			-.238	.209
Believe in evolution	.227	.145	.228	.145		
Male x centered number of children	.072	.085				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			.055	.265		
Female x religious (n=1409)			**.422 **	**.149**		
Female x not religious (n=177)			**.954 **	**.344**		
Male x believe in evolution (n=249)					.228	.207
Male x not believe in evolution (n=236)					REFERENCE	
Female x believe in evolution (n=257)					**.709 **	**.208**
Female x not believe in evolution (n=353)					**.482 *	**.193**
Pseudo R^2	.043		.043		.042	
N	918		918		918	

* p<.05 ** p<.01 *** p<.001

Table 7.11a Ordered Logistic Regression Interaction Models of I Help the Environment

	Male x Centered Age			Male x White			Male x Low Class			Male x Centered Years of Education		
	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error	Regression Coefficient		Standard Error
Male	-.032		.125							-.027		.124
Age (centered)	(.018)	**	.005	.018	***	.004	.018	***	.004	.018	***	.004
White	-.282		.159				-.283		.159	-.297		.160
Low class	.024		.127	.025		.127				.024		.127
Years of education (centered)	.086	***	.024	.090	***	.024	.087	***	.024	(.104)	**	.033
Republican	.116		.143	.108		.144	.117		.144	.120		.143
Reside in urban setting	-.283	*	.124	-.288	*	.125	-.283	*	.124	-.283	*	.124
Ever been married	-.088		.160	-.062		.161	-.088		.160	-.089		.160
Number of children (centered)	.078		.044	.071		.044	.078		.044	.082		.044
Religious	.094		.179	.093		.179	.094		.179	.092		.179
Believe in evolution	.289	*	.128	.277	*	.128	.289	*	.128	.296	*	.128
Male x centered age	.001		.008									
Male x white (n=997)				**-.430**	*****	**.215**						
Male x non-white (n=232)				-.409		.271						
Female x white (n=1216)				**-.493**	*****	**.210**						
Female x non-white (n=372)				REFERENCE								
Male x low class (n=615)							.035		.184			
Male x not low class (n=608)							REFERENCE					
Female x low class (n=807)							.060		.177			
Female x not low class (n=773)							.043		.174			
Male X centered years of education										-.035		.044
Pseudo R^2	.024			.026			.024			.025		
N	1019			1019			1019			1019		

* p<.05 ** p<.01 *** p<.001

Table 7.11b Ordered Logistic Regression Interaction Models of I Help the Environment

	Male x Republican		Male x Reside in Urban Setting		Male x Ever Been Married	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male						
Age (centered)	.018 ***	.004	.018 ***	.004	.018 ***	.004
White	-.281	.159	-.283	.159	-.263	.160
Low class	.031	.127	.025	.127	.022	.127
Years of education (centered)	.086 ***	.024	.087 ***	.024	.085 ***	.024
Republican			.116	.143	.115	.143
Reside in urban setting	-.281 *	.125			-.274 *	.125
Ever been married	-.085	.160	-.088	.160		
Number of children (centered)	.077	.044	.077	.044	.072	.044
Religious	.091	.179	.094	.179	.100	.179
Believe in evolution	.290 *	.128	.289 *	.128	.285 *	.128
Male x Republican (n=349)	.126	.191				
Male x not Republican (n=880)	-.083	.144				
Female x Republican (n=335)	.022	.200				
Female x not Republican (n=1253)	REFERENCE					
Male x urban (n=242)			-.294	.183		
Male x not urban (n=291)			REFERENCE			
Female x urban (n=288)			-.249	.176		
Female x not urban (n=386)			.025	.164		
Male x ever been married (n=867)					REFERENCE	
Male x not ever been married (n=361)					-.107	.216
Female x ever been married (n=1237)					-.062	.143
Female x not ever been married (n=351)					.204	.213
Pseudo R^2	.025		.024		.025	
N	1019		1019		1019	

* p<.05 ** p<.01 *** p<.001

Table 7.11c Ordered Logistic Regression Interaction Models of I Help the Environment

	Male x Centered Number of Children		Male x Religious		Male x Believe in Evolution	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-.037	.124				
Age (centered)	.018 ***	.004	.018 ***	.004	.018 ***	.004
White	-.281	.159	-.283	.159	-.270	.160
Low class	.025	.127	.024	.127	.026	.127
Years of education (centered)	.088 ***	.024	.086 ***	.024	.089 ***	.024
Republican	.116	.143	.116	.143	.106	.143
Reside in urban setting	-.292 *	.125	-.283 *	.124	-.280 *	.125
Ever been married	-.072	.162	-.086	.160	-.088	.160
Number of children (centered)	(.098)	.054	.077	.044	.081	.044
Religious	.099	.179			.079	.179
Believe in evolution	.290 *	.128	.289 *	.128		
Male x centered number of children	-.051	.076				
Male x religious (n=1006)			REFERENCE			
Male x not religious (n=221)			-.129	.229		
Female x religious (n=1409)			.022	.133		
Female x not religious (n=177)			-.019	.283		
Male x believe in evolution (n=249)					-.268	.179
Male x not believe in evolution (n=236)					-.314	.185
Female x believe in evolution (n=257)					REFERENCE	
Female x not believe in evolution (n=353)					**-.488 **	**.169**
Pseudo R^2	.025		.024		.026	
N	1019		1019		1019	

* p<.05 ** p<.01 *** p<.001

Table 7.12a Robust Regression Interaction Models of Feelings toward Environmentalists

	Male x Centered Age		Male x White		Male x Low & Working Class		Male x Centered Educational Attainment	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-5.456 ***	.999					-5.373 ***	1.001
Age (centered)	(.051)	.044	.060	.034	.060	.034	.060	.034
White	-8.360 ***	1.093			-8.386 ***	1.092	-8.421 ***	1.094
Low & working class	.549	1.037	.523	1.030			.470	1.039
Educational attainment (centered)	.878 *	.340	.855 *	.338	.928 **	.341	(1.297) **	.450
Republican thermometer (centered)	-.071 ***	.020	-.072 ***	.019	-.071 ***	.020	-.070 ***	.020
Reside in urban setting	.744	1.258	.702	1.249	.710	1.256	.649	1.258
Ever been married	-2.339	1.288	-2.320	1.278	-2.306	1.285	-2.287	1.287
Religious	-1.106	1.357	-1.094	1.348	-1.113	1.355	-1.080	1.357
Male x centered age	.019	.059						
Male x white (n=522)			REFERENCE					
Male x non-white (n=471)			**13.274 *** 1.541**					
Female x white (n=661)			**9.502 *** 1.335**					
Female x non-white (n=652)			**14.116 *** 1.442**					
Male x low & working class (n=555)					**3.048 * 1.529**			
Male x not low & working class (n=451)					REFERENCE			
Female x low & working class (n=728)					**6.595 *** 1.459**			
Female x not low & working class (n=539)					**7.906 *** 1.509**			
Male X centered educational attainment							-.912	.644
N	1735		1735		1735		1735	

* p<.05 ** p<.01 *** p<.001

Table 7.12b Robust Regression Interaction Models of Feelings toward Environmentalists

	Male x Centered Republican Thermometer		Male x Reside in Urban Setting		Male x Ever Been Married		Male x Religious	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	-5.384 ***	.997						
Age (centered)	.060	.034	.061	.034	.060	.034	.063	.034
White	-8.390 ***	1.091	-8.349 ***	1.093	-8.354 ***	1.093	-8.439 ***	1.093
Low & working class	.571	1.035	.574	1.037	.552	1.037	.551	1.036
Educational attainment (centered)	.896 **	.340	.898 **	.340	.876 *	.340	.870 *	.340
Republican thermometer (centered)	(-.027)	.025	-.071 ***	.020	-.071 ***	.020	-.069 ***	.020
Reside in urban setting	.740	1.254			.745	1.258	.729	1.256
Ever been married	-2.338	1.283	-2.294	1.286			-2.365	1.286
Religious	-1.177	1.354	-1.119	1.356	-1.114	1.357		
Male x centered Republican thermometer	**-.105 **	**.038**						
Male x urban (n=767)			3.481	1.931				
Male x not urban (n=172)			REFERENCE					
Female x urban (n=967)			**8.046 ***	**1.908**				
Female x not urban (n=264)			**9.124 ***	**2.222**				
Male x ever been married (n=675)					REFERENCE			
Male x not ever been married (n=319)					1.828	1.736		
Female x ever been married (n=991)					**5.203 ***	**1.170**		
Female x not ever been married (n=323)					**7.954 ***	**1.751**		
Male x religious (n=774)							**-4.193 ***	**1.092**
Male x not religious (n=216)							**-6.680 ***	**1.806**
Female x religious (n=1132)							REFERENCE	
Female x not religious (n=177)							**4.866 *	**1.955**
N	1735		1735		1735		1735	

* p<.05 ** p<.01 *** p<.001

Table 7.13a Ordered Logistic Regression Interaction Models of Lower Power Plant Emissions

	Male x Centered Age		Male x White		Male x Low & Working Class		Male x Centered Educational Attainment	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.087	.138					.086	.138
Age (centered)	(.000)	.006	-.005	.005	-.005	.005	-.005	.005
White	.384 *	.151			.379 *	.150	.370 *	.151
Low & working class	-.056	.143	-.058	.143			-.077	.143
Educational attainment (centered)	.096 *	.046	.095 *	.046	.095 *	.046	(.153) *	.059
Republican thermometer (centered)	-.006 *	.003	-.006 *	.003	-.006 *	.003	-.006 *	.003
Reside in urban setting	-.058	.178	-.045	.178	-.043	.178	-.049	.178
Ever been married	-.035	.179	-.045	.179	-.052	.178	-.044	.178
Religious	-.037	.180	-.028	.180	-.031	.180	-.029	.181
Male x centered age	-.013	.008						
Male x white (n=522)			**.453 ***	**.203**				
Male x non-white (n=471)			.222	.194				
Female x white (n=661)			**.490 ***	**.191**				
Female x non-white (n=652)			REFERENCE					
Male x low & working class (n=555)					-.105	.214		
Male x not low & working class (n=451)					REFERENCE			
Female x low & working class (n=728)					-.165	.205		
Female x not low & working class (n=539)					-.139	.210		
Male X centered educational attainment							-.134	.086
Pseudo R^2	.015		.014		.014		.015	
N	984		984		984		984	

* p<.05 ** p<.01 *** p<.001

Table 7.13b Ordered Logistic Regression Interaction Models of Lower Power Plant Emissions

	Male x Centered Republican Thermometer		Male x Reside in Urban Setting		Male x Ever Been Married		Male x Religious	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.087	.138						
Age (centered)	-.005	.005	-.005	.005	-.005	.005	-.005	.005
White	.380 *	.150	.392 **	.151	.385 *	.151	.359 *	.151
Low & working class	-.058	.143	-.053	.143	-.058	.143	-.063	.143
Educational attainment (centered)	.095 *	.046	.097 *	.046	.098 *	.046	.096 *	.046
Republican thermometer (centered)	(-.007) *	.003	-.006 *	.003	-.006 *	.003	-.006 *	.003
Reside in urban setting	-.043	.178			-.057	.178	-.043	.178
Ever been married	-.054	.178	-.037	.179			-.056	.179
Religious	-.030	.180	-.020	.181	-.030	.181		
Male x centered Republican thermometer	.003	.005						
Male x urban (n=767)			**.530 ***	**.267**				
Male x not urban (n=172)			REFERENCE					
Female x urban (n=967)			.256	.260				
Female x not urban (n=264)			**.689 ***	**.315**				
Male x ever been married (n=675)					-.389	.243		
Male x not ever been married (n=319)					REFERENCE			
Female x ever been married (n=991)					-.308	.235		
Female x not ever been married (n=323)					**-.560 ***	**.263**		
Male x religious (n=774)							.217	.153
Male x not religious (n=216)							-.036	.221
Female x religious (n=1132)							REFERENCE	
Female x not religious (n=177)							.442	.290
Pseudo R^2	.014		.018		.016		.016	
N	984		984		984		984	

* p<.05 ** p<.01 *** p<.001

Table 7.14a Ordered Logistic Regression Interaction Models of Support for Gas Tax

	Male x Centered Age		Male x White		Male x Low & Working Class		Male x Centered Educational Attainment	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.097	.146					.113	.147
Age (centered)	(.005)	.006	.009	.005	.009	.005	.009	.005
White	-.217	.161			-.208	.161	-.221	.161
Low & working class	-.309 *	.152	-.302 *	.152			-.325 *	.152
Educational attainment (centered)	.034	.049	.033	.049	.032	.049	(.096)	.063
Republican thermometer (centered)	-.002	.003	-.002	.003	-.002	.003	-.002	.003
Reside in urban setting	.015	.192	.007	.192	.010	.192	.001	.192
Ever been married	-.316	.188	-.302	.188	-.307	.188	-.300	.188
Religious	-.585 **	.181	-.581 **	.181	-.586 **	.181	-.585 **	.181
Male x centered age	.007	.008						
Male x white (n=522)			**-.619 **	**.225**				
Male x non-white (n=471)			REFERENCE					
Female x white (n=661)			-.350	.208				
Female x non-white (n=652)			**-.492 *	**.210**				
Male x low & working class (n=555)					**-.430 *	**.218**		
Male x not low & working class (n=451)					REFERENCE			
Female x low & working class (n=728)					**-.421 *	**.209**		
Female x not low & working class (n=539)					-.217	.211		
Male X centered educational attainment							-.139	.090
Pseudo R^2	.015		.019		.015		.016	
N	991		991		991		991	

* p<.05 ** p<.01 *** p<.001

Table 7.14b Ordered Logistic Regression Interaction Models of Support for Gas Tax

	Male x Centered Republican Thermometer		Male x Reside in Urban Setting		Male x Ever Been Married		Male x Religious	
	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Male	.098	.146						
Age (centered)	.009	.005	.009	.005	.008	.005	.009	.005
White	-.212	.161	-.213	.161	-.213	.161	-.227	.162
Low & working class	-.306 *	.151	-.306 *	.151	-.307 *	.151	-.306 *	.152
Educational attainment (centered)	.034	.049	.035	.049	.034	.049	.034	.049
Republican thermometer (centered)	(-.003)	.004	-.002	.003	-.002	.003	-.002	.003
Reside in urban setting	.009	.192			.009	.192	.009	.192
Ever been married	-.308	.188	-.308	.188			-.313	.188
Religious	-.585 **	.181	-.584 **	.181	-.585 **	.181		
Male x centered Republican thermometer	.003	.005						
Male x urban (n=767)			.010	.295				
Male x not urban (n=172)			REFERENCE					
Female x urban (n=967)			-.088	.292				
Female x not urban (n=264)			-.094	.343				
Male x ever been married (n=675)					REFERENCE			
Male x not ever been married (n=319)					.264	.244		
Female x ever been married (n=991)					-.123	.172		
Female x not ever been married (n=323)					.230	.257		
Male x religious (n=774)							.208	.164
Male x not religious (n=216)							**.572 ***	**.232**
Female x religious (n=1132)							REFERENCE	
Female x not religious (n=177)							**.873 **	**.265**
Pseudo R^2	.015		.015		.015		.016	
N	991		991		991		991	

* p<.05 ** p<.01 *** p<.001

Table 7.15 Summary of Interaction Models – General Social Survey Dataset

	Gender x									
	Age	Race	Social Class	Education	Political Party	Place of Residence	Marital Status	No. of Children	Religious Affiliation	Belief in Evolution
Willingness to Pay			•		•		•			
Environmental Problems are Dangerous		•		•	•					
Opportunity Cost		•	•		•				•	
Reliance on Science		•		•						•
Modern Life Harms the Environment		•			•					
Economic Growth Protects the Environment		•		•						
Growth Harms the Environment	•	•			•					
Concerned about Population Growth		•			•				•	•
Progress is Dependent on the Health of Environment		•	•		•					
Likelihood of Damage from a Nuclear Accident		•			•					
I Help the Environment		•								•

• = significant interaction effect

Measure of environmental concern in **bold** indicate that gender is a significant predictor of that measure in the bivariate model

Table 7.16 Summary of Interaction Models – American National Election Survey Dataset

	Gender x							
	Age	Race	Social Class	Education	Political Party	Place of Residence	Marital Status	Religious Affiliation
Feelings toward Environmentalists		•	•		•			•
Lower Power Plant Emissions		•				•	•	
Support for Gas Tax		•	•					•

• = significant interaction effect

Measure of environmental concern in **bold** indicate that gender is a significant predictor of that measure in the bivariate model

Gender x Age Interaction

The gender times centered age interaction term is only significant in one out of fourteen measures of environmental concern: growth harms the environment (b = -.023, p<.01; Table 7.7a). Figure 7.1 displays a visual representation of the different slopes for men and women, such that as men age they become *less* likely to think that economic growth is harmful to the environment yet as women age they become *more* likely to believe that economic growth is harmful to the environment. Thus, the age hypothesis (younger people have a greater concern for the environment than older people; Jones and Dunlap 1992) as discussed in detail in Chapter Three, is only accurate to describe what is happening for men as it predicts the concern that growth harms the environment.

Furthermore, as Figure 7.1 illustrates, there is a cross-over effect somewhere between the early- to mid-thirties, prior to that age men express greater concern for economic growth that could harm the environment than women. Additionally, as noted in the multivariate results section, age becomes a negative predictor of environmental problems are dangerous in the full model but is not a significant predictor of environmental problems are dangerous in the reduced model suggesting the possibility of a moderating effect. When tested, it is determined that there is no interaction effect between gender and age in the environmental problems are dangerous model. However, because gender is the primary focus of this dissertation, interaction terms were only created between gender and the various socio-demographic variables. More research is needed to determine if there is an interaction effect between age and other socio-demographic variables, as I suspect there might be.

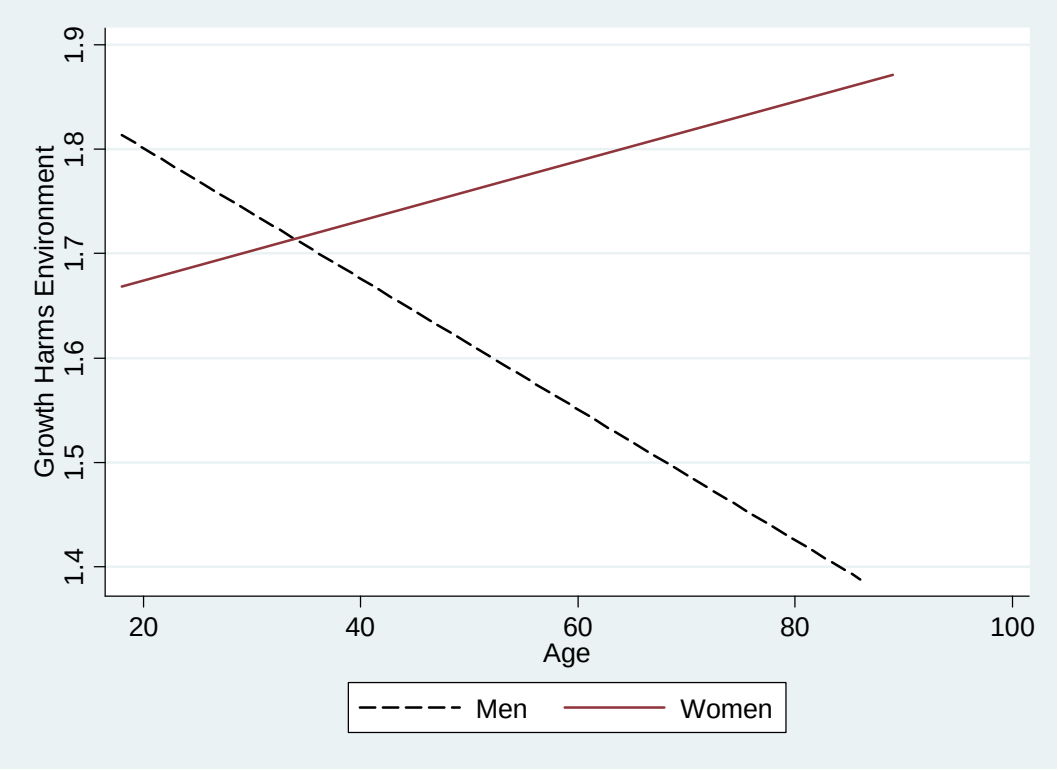

Figure 7.1 Interaction between Gender and Age for Growth Harms the Environment Model

Gender x Race Interaction

The gender times race interaction is significant on thirteen out of fourteen measures of environmental concern, the exception is willingness to pay. Four indicator variables were created to test for interactions between gender and race in the GSS dataset: white men (n=997) versus not, non-white men (n=232) versus not, white women (n=1216) versus not, and non-white women (n=372) versus not. Similarly four indicator variables were created to test for interactions between gender and race in the ANES dataset: white men (n=522) versus not, non-white men (n=471) versus not, white women (n=661) versus not, and non-white women (n=652) versus not. As is evident,

the sub-sample distribution across groups is considerably more even in the ANES dataset, yet the results were consistent across both datasets.

For the environmental problems are dangerous model white men (b = -.290, p<.01), white women (b = -.187, p<.05), and non-white women (b = -.276, p<.01) are *less* likely to be fearful of the dangers of environmental problems than non-white men (reference group[18]; Table 7.2a). For the opportunity cost model white men (b = .280, p<.001) and white women (b = .355, p<.001) are *more* willing to make sacrifices to protect the environment than non-white men (reference group; Table 7.3a). In the reliance on science model white women are 1.66 times *more* likely than white men (reference group) to *disagree* with the idea that science will solve our environmental problems (p<.001; Table 7.4a). In the modern life harms the environment model non-white women are .58 times *less* likely than non-white men (reference group) to *agree* that our modern lifestyle harms the environment (p<.05; Table 7.5a). For the economic growth protects the environment model white men (OR = 1.67, p<.05) and white women (OR = 1.95, p<.01) are *more* likely than non-white women (reference group) to *disagree* with the idea that economic growth is necessary for environmental protection (Table 7.6a). In the growth harms the environment model white men (OR = .38, p<.001), white women (OR = .55, p<.05), and non-white women (OR = .55, p<.05) are *less* likely than non-white men (reference group) to *agree* that economic growth is always harmful to the environment (Table 7.7a).

[18] The selection of a reference group is rather arbitrary, so I tested each model several ways, using different reference groups. I am reporting the significant group differences, which means that the reported reference group is not the same in all cases.

In addition, for the concerned about population growth model, white men (OR = 1.72, p<.05) and white women (OR = 1.63, p<.05) are *more* likely than non-white women (reference group) to *agree* that our current population growth rate is not sustainable (Table 7.8a). In the progress is dependent on the health of environment model white men are .62 times *less* likely than non-white women (reference group) to *agree* that economic progress is dependent on the improvement of environmental conditions (p<.05; Table 7.9a). In the likelihood of damage from a nuclear accident model non-white men (OR = 2.38, p<.01), white women (OR = 1.74, p<.001), and non-white women (OR = 2.77, p<.001) are *more* likely than white men (reference group) to believe that damage from a nuclear accident will cause long-term damage across many countries (Table 7.10a). In the I help the environment model white men (OR = .65, p<.05) and white women (OR = .61, p<.05) are *less* likely than non-white women (reference group) to help the environment regardless of the time or money involved (Table 7.11a). In the feelings toward environmentalists model, from the ANES dataset, non-white men (b = 13.183, p<.001), white women (b = 9.882, p<.001), and non-white women (b = 14.489, p<.001) are *more* likely than white men (reference group) to view environmentalists favorably (Table 7.12a). For the lower power plant emissions model, from the ANES dataset, white men (OR = 1.57, p<.05) and white women (OR = 1.63, p<.05) are more likely than non-white women (reference group) to favor government restrictions on power plant emissions (Table 7.13a). Also from the ANES dataset, in the support for gas tax model white men (OR = .54, p<.01) and non-white women (OR = .61, p<.05) are *less* likely than non-white men (reference group) to favor an increase in

gas taxes to encourage people either to drive less or buy cars that use less gasoline (Table 7.14a).

Gender x Social Class Interaction

The gender times social class interactions are significant on seven out of 14 measures of environmental concern – willingness to pay, opportunity cost, reliance on science, progress is dependent on the health of environment, likelihood of damage from a nuclear accident, feelings toward environmentalists, and support for gas tax. Four indicator variables were created to test for interactions between gender and social class in the GSS dataset: lower class men (n=615) versus not, not lower class men (n=608) versus not, lower class women (n=807) versus not, and not lower class women (n=773) versus not. Similarly four variables were created to test for interactions between gender and social class in the ANES dataset: lower and working class men (n=555) versus not, not lower and working class men (n=451) versus all others, lower and working class women (n=728) versus not, and not lower and working class women (n=539) versus all others.

In the willingness to pay model men who are not lower class ($b = .253$, $p<.01$) and women who are not lower class ($b = .259$, $p<.001$) are *more* willing to pay for environmental protection than women who are lower class (reference group; Table 7.1a). In the opportunity cost model, women who are not lower class ($b = .126$, $p<.05$) are *more* willing to make personal sacrifices to help the environment than lower class men (reference group; Table 7.3a). In the reliance on science model women who are not lower class (OR = 1.56, $p<.05$) and women who are lower class (OR = 1.79, $p<.01$) are *more* likely than men who are not lower class (reference group) to *disagree* that

modern science will solve our environmental problems (Table 7.4a). For the progress is dependent on the health of environment model women who are lower class are 1.47 times *more* likely than men who are not lower class (reference group) to *agree* that progress is dependent on the health of environment is dependent on the improvement of environmental conditions ($p<.05$; Table 7.9a). In the likelihood of damage from a nuclear accident model women who are lower class (OR = 1.72, $p<.01$) and women who are not lower class (OR = 1.52, $p<.05$) are *more* likely to be concerned about the possibility of damage from a wide-scale nuclear accident than men who are not lower class (reference group; Table 7.10a). In the feelings toward environmentalists model (Table 7.12a), from the ANES dataset, women who are lower and working class (b = 6.752, $p<.001$) and women who are not lower and working class (b = 8.162, $p<.001$) are *more* likely than men who are not lower and working class (reference group) to feel favorable toward environmentalists. Also from the ANES dataset, in the support for gas tax model men who are lower and working class (OR = .65, $p<.05$) and women who are lower and working class (OR = .66, $p<.05$) are *less* likely than men who are not lower and working class (reference group) to support an increase in gas taxes (Table 7.14a).

Gender x Education Interaction

The gender times centered years of education and gender times centered educational attainment interaction terms are significant on three out of 14 measures of environmental concern – environmental problems are dangerous (b = -.036, $p<.05$; Table 7.2a), reliance on science (OR = .90, $p<.05$; Table 7.4a), and economic growth protects the environment (OR = .87, $p<.01$; Table 7.6a). Figure 7.2 (environmental problems are dangerous), Figure 7.3 (reliance on science), and Figure 7.4 (economic

growth protects the environment) display a visual representation of the different slopes for men and women for each model, showing that, in general, as women become more educated their concern for the environment *increases* yet as men become more educated their level of concern for the environment either *decreases* or *increases* but at a slower rate than that of women, depending on the outcome being measured. Specifically for the environmental problems are dangerous model, as women gain more years of education their fear of the dangers of environmental destruction *increases* but as men become more educated their fear of environmental problems *decrease*. As illustrated in Figure 7.2, there is a cross-over effect approximately between eleven and thirteen years of education – or at about the level of a high school diploma. Prior to that high school diploma level of education, men express greater fear of the dangers of environmental problems than women.

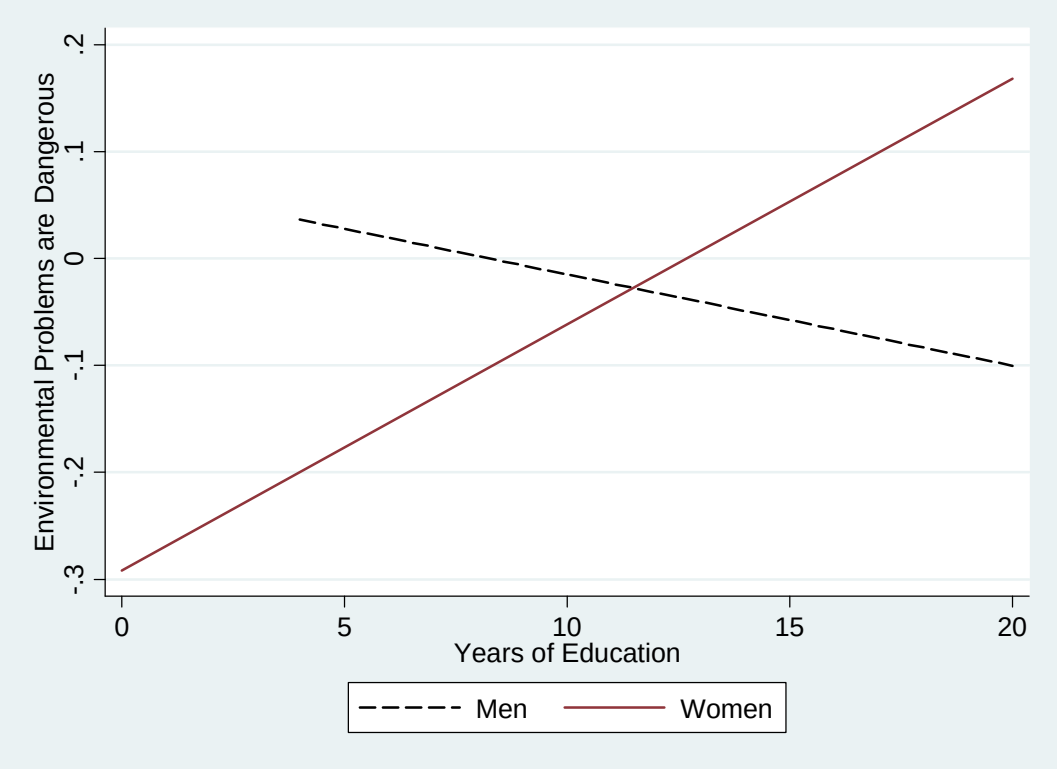

Figure 7.2 Interaction between Gender and Years of Education for Environmental Problems are Dangerous Model

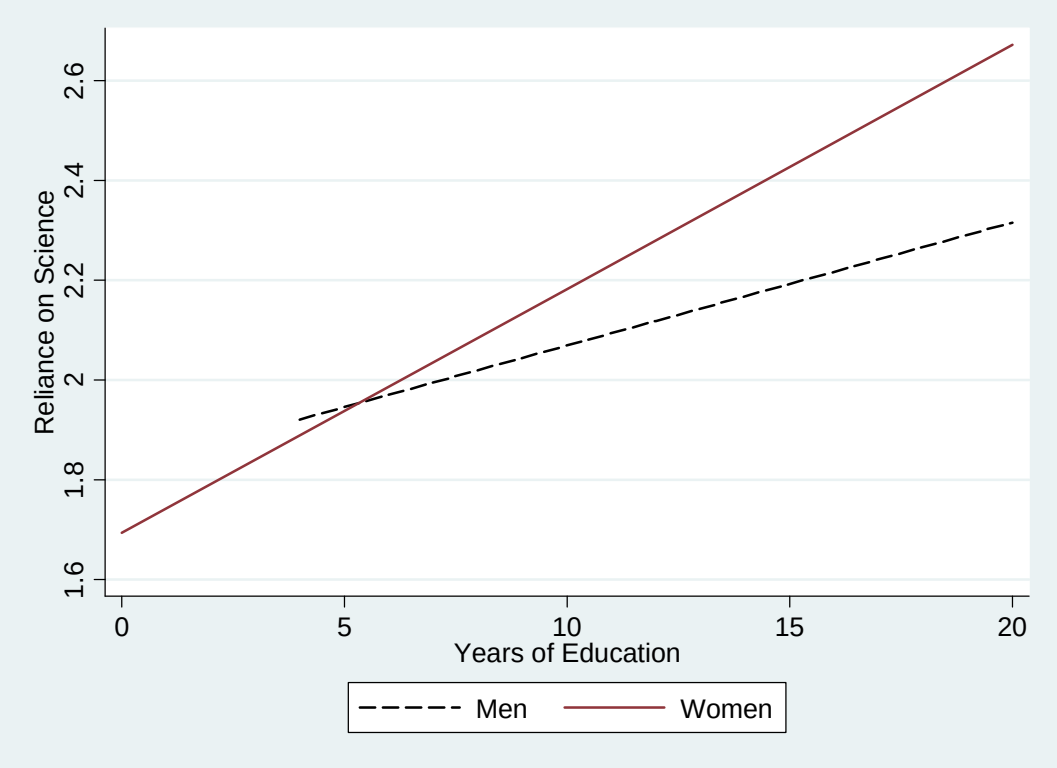

Figure 7.3 Interaction between Gender and Years of Education for Reliance on science Model

Specifically for the reliance on science model (Figure 7.3), as women gain more years of education they are *more* likely to *disagree* with the idea that science will solve our environmental problems. As men gain more years of education they are also *more* likely to *disagree* with the concept that modern science is the answer to our environmental problems but at a slower rate than women. There is a cross-over effect in the early years of education (approximately at five or six years) where men who have around six years of education or less are *more* likely to *disagree* that science will solve environmental problems than women who have six years of education or less.

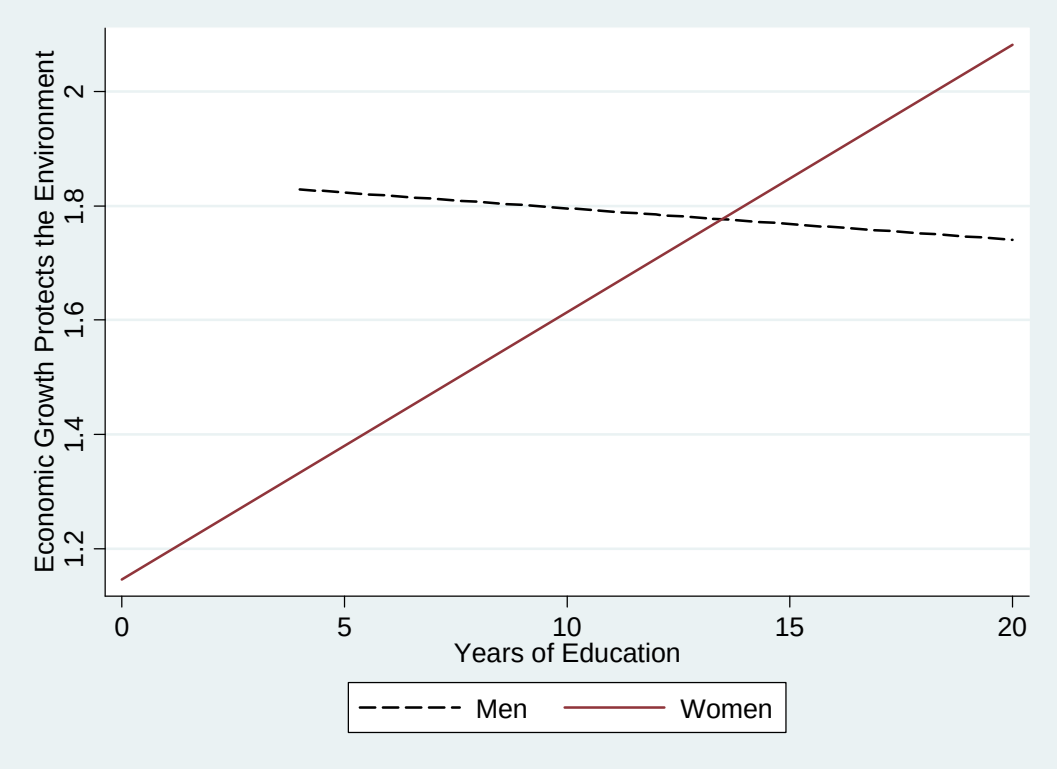

Figure 7.4 Interaction between Gender and Years of Education for Economic Growth Protects the Environment Model

Interestingly, for the economic growth protects the environment model (Figure 7.4), as women become more educated they are *more* likely to *disagree* with the idea that economic growth is necessary for environmental protection yet as men become more educated they are *less* likely to *disagree* with the notion that economic growth is necessary for environmental protection. As Figure 7.4 illustrates, the education effect is greater for women, that is the slope for men is relatively flat, indicating that there is almost no education effect for men with regards to this predictor. Additionally, there is a cross-over effect happening somewhere between twelve and fifteen years of education where prior to that point men are *more* likely than women to *disagree* that economic growth is necessary for environmental protection.

In general, the significance of the gender times years of education interaction term on these three measures of environmental concern (environmental problems are dangerous, reliance on science, and economic growth protects the environment) suggest that the prevailing notion – a positive association between education and environmental concern as discussed in Chapter Three (Van Liere and Dunlap 1980) – might only be accurate to describe the experiences of women. Men, however, might experience a more complex relationship between education and environmental concern.

Gender x Political Party Interaction

The gender times political party interaction and gender times Republican feeling thermometer interaction term is significant on ten out of 14 measures of environmental concern: willingness to pay, environmental problems are dangerous, opportunity cost, reliance on science, modern life harms the environment, growth harms the environment, concerned about population growth, progress is dependent on the health of environment, likelihood of damage from a nuclear accident, and the environmentalist feeling thermometer. Four variables were created to test for interactions between gender and political party affiliation in the GSS dataset: Republican men (n=349) versus not, non-Republican men (n=880) versus others, Republican women (n=335) versus not, and non-Republican women (n=1253) versus others. An interaction term between gender and the Republican feeling thermometer (mean centered) was created for the ANES dataset.

For the willingness to pay measure of environmental concern non-Republican men ($b = .290$, $p<.01$) and non-Republican women ($b = .253$, $p<.01$) are *more* willing to pay for environmental protection than Republican women (reference group; Table 7.1b).

In the environmental problems are dangerous model non-Republican men (b = .254, p<.01) and non-Republican women (b = .259, p<.001) are *more* fearful of the dangers of environmental problems than Republican men (reference group; Table 7.2b). In the opportunity cost model Republican men (b = -.194, p<.01), non-Republican men (b = -.097, p<.05), and Republican women (b = -.186, p<.01) are *less* willing to make personal sacrifices to protect the environment than non-Republican women (reference group; Table 7.3b). In the reliance on science model Republican men (OR = .54, p<.05) and non-Republican men (OR = .54, p<.01) are *less* likely than Republican women (reference group) to *disagree* with the idea that modern science will solve our environmental problems (Table 7.4b). For the modern life harms the environment measure of environmental concern non-Republican men (OR = 1.71, p<.01) and non-Republican women (OR = 1.63, p<.05) are *more* likely than Republican women (reference group) to *agree* that our modern lifestyle harms the environment (Table 7.5b). In the growth harms the environment model non-Republican women are 1.50 times *more* likely than Republican men (reference group) to *agree* that economic growth is always harmful to the environment (p<.05; Table 7.7b). In the concerned about population growth model non-Republican men (OR = 1.69, p<.05) and non-Republican women (OR = 1.63, p<.05) are *more* likely than Republican women (reference group) to *agree* that our current concerned about population growth rate is not sustainable (Table 7.8b). For the progress is dependent on the health of environment measure of environmental concern non-Republican men (OR = 1.49, p<.05) and non-Republican women (OR = 1.88, p<.01) are *more* likely than Republican men (reference group) to *agree* that economic progress is dependent on the improvement of environmental

conditions (Table 7.9b). In the likelihood of damage from a nuclear accident model Republican men (OR = .46, p<.001), non-Republican men (OR = .58, p<.01), and Republican women (OR = .64, p<.05) are *less* likely than non-Republican women (reference group) to be concerned about the possibility of damage from a wide-scale nuclear accident (Table 7.10b).

In the ANES dataset, the interaction term created between gender and the centered Republican feeling thermometer is significant in the environmentalist feeling thermometer model (b = -.090, p<.05; Table 7.12b) but not in the lower power plant emissions and support for gas tax models. Figure 7.5 displays a visual representation of the different slopes for men and women, indicating that both men and women who are *more* favorable toward the Republican Party are *less* favorable toward environmentalists. However, favorability for environmentalists declines at a slower rate for women than men.

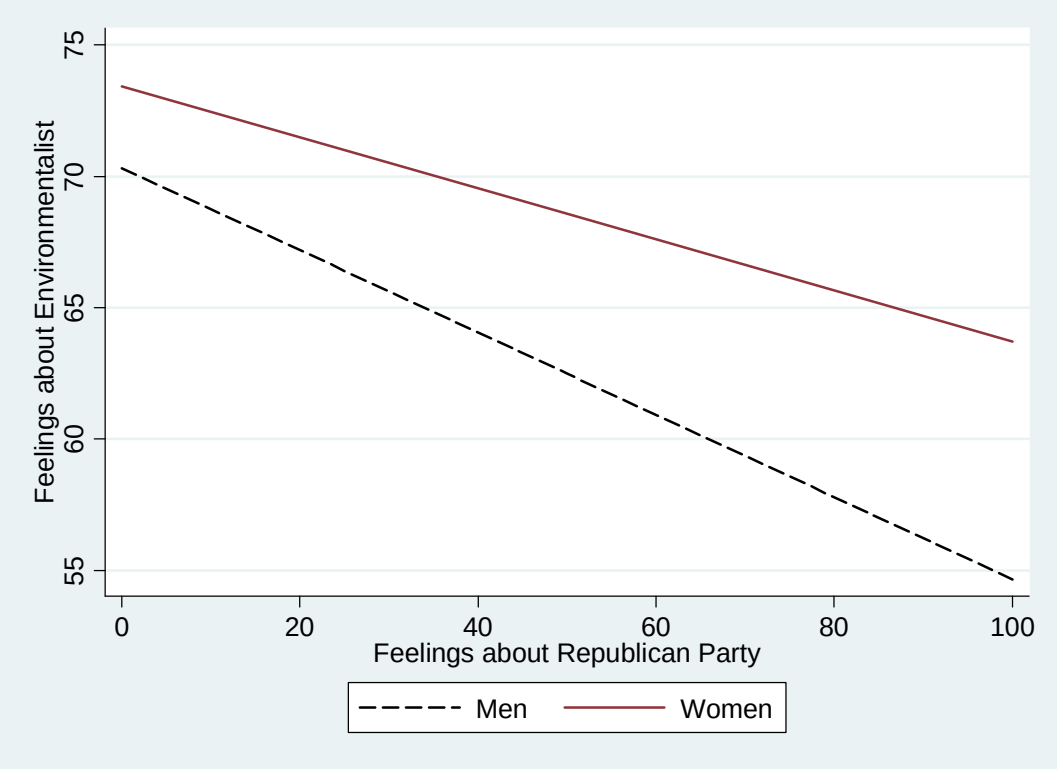

Figure 7.5 Interaction between Gender and Republican Feeling Thermometer for the Feelings toward Environmentalists Model

Gender x Place of Residence Interaction

The gender times place of residence interaction is significant on four out of 14 measures of environmental concern: reliance on science, likelihood of damage from a nuclear accident, feelings toward environmentalists, and lower power plant emissions. Four indicator variables were created to test for interactions between gender and place of residence in the GSS dataset: men who reside in an urban setting (n=242) versus others, men who do not reside in an urban setting (n=291) versus others, women who reside in an urban setting (n=288) versus others, and women who do not reside in an urban setting (n=386) versus others. Similarly four indicator variables were created to test for interactions between gender and place of residence in the ANES dataset: men

who reside in an urban setting (n=767) versus others, men who do not reside in an urban setting (n=172) versus others, women who reside in an urban setting (n=967) versus others, and women who do not reside in an urban setting (n=264) versus others.

For the reliance on science measure of environmental concern, men who reside in an urban setting (OR = .58, p<.01) and men who do not reside in an urban setting (OR = .63, p<.05) are *less* likely to *disagree* with the idea that modern science will solve our environmental problems than women who reside in an urban setting (reference group; Table 7.4b). For the likelihood of damage from a nuclear accident model women who reside in an urban location (OR = 1.63, p<.05) and women who do not reside in an urban setting (OR = 1.68, p<.01) are *more* likely than men who do not reside in an urban setting (reference group) to be concerned about the possibility of damage from a wide-scale nuclear accident (Table 7.10b). In the feelings toward environmentalists model, from the ANES dataset, women who reside in an urban setting (b = 8.344, p<.001) and women who do not reside in an urban setting (b = 10.114, p<.001) view environmentalists *more* favorably than men who do not reside in an urban setting (reference group; Table 7.12b). Also from the ANES dataset, in the lower power plant emissions measure of environmental concern men who reside in an urban setting (OR = 1.70, p<.05) and women who do not reside in an urban setting (OR = 1.99, p<.05) are *more* likely than men who do not reside in an urban setting (reference group) to favor government restrictions on power plant emissions (Table 7.13b).

Gender x Marital Status Interaction

The gender times marital status interaction is significant on five out of 14 measures of environmental concern: willingness to pay, reliance on science, likelihood

of damage from a nuclear accident, feelings toward environmentalists, and lower power plant emissions. Four indicator variables were created to test for interactions between gender and marital status in the GSS dataset: ever married men (n=867) versus others, men who have never been married (n=361) versus others, ever married women (n=1237) versus others, and women who have never been married (n=351) versus others. Similarly four indicator variables were created to test for interactions between gender and marital status in the ANES dataset: ever married men (n=675) versus others, men who have never been married (n=319) versus others, ever married women (n=991) versus others, and women who have never been married (n=323) versus others.

For the willingness to pay model women who are either currently married or who have been married at some point in their lifetime are *less* likely ($b = -.203$, $p<.05$) to be willing to pay for environmental protection than men who have never been married (reference group; Table 7.1b). In the reliance on science model, ever married men (OR = .52, $p<.01$) and never married men (OR = .51, $p<.01$) are *less* likely than never married women (reference group) to *disagree* that modern science will solve our environmental problems (Table 7.4b). For the likelihood of damage from a nuclear accident measure of environmental concern ever married women (OR = 1.52, $p<.01$) and never married women (OR = 1.98, $p<.01$) are *more* likely than ever married men (reference group) to be concerned about potential damage from a wide-scale nuclear accident (Table 7.10b). In the feelings toward environmentalists model, from the ANES dataset, ever married women ($b = 6.023$, $p<.001$) and never married women ($b = 8.467$, $p<.001$) are more likely to feel favorable toward environmentalists than ever married

men married (reference group: Table 7.12b). Thus, if ever married and never married women are different from ever married men, and never married men are *not* different from ever married men, then what we see is that men are different from women, regardless of their marital status.

Gender x Number of Children Interaction

The gender times mean centered number of children interaction term is not significant on the eleven measures of environmental concern tested. Number of children belonging to the respondent is not measured in the ANES dataset. These null findings are interesting. As discussed in Chapter Three, previous literature has suggested that men with young children are less concerned about the environment while women with young children are more worried about environmental risk (Davidson and Freudenburg 1996). The theoretical explanation postulates that when men have children they have increased economic responsibilities (and thus competing interests with environmental protection), yet when women have children they have increased safety concerns (and thus have greater concern for hazardous environmental conditions). The results of studies testing men's parental roles have produced varied results; however, studies examining women's parental roles have shown moms to exhibit a greater concern than dads for environmental risk (Davidson and Freudenburg 1996; see e.g. Blocker and Eckberg 1989; Bord and O'Connor 1992). However, I did not find any find any differences in various measures of environmental concern between men with children and women with children. Nor did I find any differences in multiple measures of environmental concern between women with children and women without

children, providing a lack of support for the relevance of children as the mechanism for explaining gender differences in environmental concern.

Interestingly, in the concerned about population growth model, when several interactions are tested for, number of children becomes significant despite being non-significant in the multivariate (non-moderated) model. There is a negative correlation between number of children and concerned about population growth in the bivariate model, which seems logical given that it might be easier to criticize population growth rates the fewer children you have. When the gender times centered years of education interaction term is tested, number of children becomes a negative predictor of concerned about population growth (Table 7.8a). When the gender times place of residence interaction term is tested, number of children also becomes a negative predictor of concerned about population growth (Table 7.8b). In the future, it would be worth considered if there is a three-way interaction between gender, number of children, and education as well as gender, number of children, and urban residence.

Male x Religious Affiliation Interaction

The gender times religious affiliation interaction is significant on six out of 14 measures of environmental concern: opportunity cost, reliance on science, concerned about population growth, likelihood of damage from a nuclear accident, feelings toward environmentalists, and support for gas tax. Four indicator variables were created to test for interactions between male and religious affiliation in the GSS dataset: men who report a religious affiliation (n=1006) versus all others, men who do not report a religious affiliation (n=221) versus all others, women who report a religious affiliation (n=1409) versus all others, and women who do not report a religious affiliation (n=177) versus all

others. Similarly four variables were created to test for interactions between male and religious affiliation in the ANES dataset: men who report a religious affiliation (n=774) versus all others, men who do not report a religious affiliation (n=216) versus all others, women who report a religious affiliation (n=1132) versus all others, and women who do not report a religious affiliation (n=177) versus all others.

For the opportunity cost model women who do not report a religious affiliation are *more* willing (b = .219, p<.05) than men who report a religious affiliation (reference group) to make sacrifices for environmental protection (Table 7.3c). In the reliance on science model women who report a religious affiliation (OR = 1.47, p<.01) and women who do not report a religious affiliation (OR = 2.10, p<.05) are *more* likely than men who report a religious affiliation (reference group) to *disagree* with the idea that modern science is the solution to our environmental problems (Table 7.4c). In the concerned about population growth model men who report a religious affiliation (OR = .58, p<.05) and women who report a religious affiliation (OR = .53, p<.05) are *less* likely than men who do not report a religious affiliation (reference group) to *agree* that our current population growth rate is unsustainable (Table 7.8c). For the likelihood of damage from a nuclear accident measure of environmental concern women who report a religious affiliation (OR = 1.52, p<.01) and women who do not report a religious affiliation (OR = 2.60, p<.01) are *more* likely to be concerned about the possibility of damage from a wide-scale nuclear accident than men who report a religious affiliation (reference group; Table 7.10c). For the feelings toward environmentalists model, in the ANES dataset, men who report a religious affiliation (b = -4.791, p<.001) and men who do not report a religious affiliation (b = -7.010, p<.001) are *less* likely than women who report a religious

affiliation (reference group) to feel favorably toward environmentalists. However, women who do not report a religious affiliation (b = 5.005, p<.05) are *more* likely than women who report a religious affiliation to feel favorably toward environmentalists (Table 7.12b). Also from the ANES dataset, in the support for gas tax model men who do not report a religious affiliation (OR = 1.77, p<.05) and women who do not report a religious affiliation (OR = 2.39, p<.01) are *more* likely than women who do report a religious affiliation (reference group) to favor an increase in support for gas taxes.

Gender x Belief in Evolution Interaction

The gender times belief in evolution interaction is significant on four out of 11 measures of environmental concern tested: reliance on science, concerned about population growth, likelihood of damage from a nuclear accident, and I help the environment. Belief in evolution is not an available measured in the ANES dataset. Four variables were created to test for interactions between gender and belief in evolution in the GSS dataset: men who believe in evolution (n=249) versus all others, men who do not believe in evolution (n=236) versus all others, women who believe in evolution (n=257) versus all others, and women who do not believe in evolution (n=353) versus all others.

For the reliance on science measure of environmental concern men who do not believe in evolution (OR = 1.48, p<.05), women who believe in evolution (OR = 1.82, p<.01) and women who do not believe in evolution (OR = 2.00, p<.001) are *more* likely to *disagree* that modern science is the solution to our environmental problems than men who believe in evolution (reference group; Table 7.4c). In the concerned about population growth model men who believe in evolution (OR = 1.98, p<.001) and women

who believe in evolution (OR = 1.88, p<.001) are *more* likely than women who do not believe in evolution (reference group) to *agree* that our current population growth rate is problematic (Table 7.8c). For the likelihood of damage from a nuclear accident model women who believe in evolution (OR = 2.03, p<.01) and women who do not believe in evolution (OR = 1.62, p<.05) are *more* likely to be concerned about the possibilities of a wide-scale nuclear accident than men who do not believe in evolution (reference group; Table 7.10c). For the I help the environment model women who do not believe in evolution are .61 times *less* likely than women who believe in evolution (reference group) to self-report doing what is right for the environment (p<.01; Table 7.11c).

Conclusions

The answers to research questions four and five are rather simple, yet the implications are not. In the first chapter I posed the question of whether or not there are interaction effects between gender and socio-demographic factors with regard to environmental concern. The results here indicate that there are 43 models with significant interaction effects between gender and various socio-demographic measures. This supports Collins (1990) notion that intersectionality cannot be ignored. Gender in conjunction with other socio-demographic characteristics has the potential to produced different effects than when gender is considered alone.

Additionally, in Chapter One I also posed the question of whether any potential interactions would be consistent across a variety of datasets using different samples and different measures of environmental concern. The results presented here are not necessarily consistent within each model, although overall, given the large numbers of

interactions I found, it seems safe to conclude that the relationships between gender and environmental concern are complicated by other socio-demographic factors.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS

Women tend to express a greater concern for the environment than men; this was established in the mid-nineties with the work of Davidson and Freudenburg (1996). Yet, there are several nuances regarding the differing levels of environmental concern between men and women that have not been explored. I have identified four gaps in the current literature. (1) The differences between men and women have been oversimplified. (2) The intersection of gender and other socio-demographic variables has been largely ignored. (3) Men and women have been stratified into homogeneous groups so that the differences among men and among women have been underestimated. And (4) the hypotheses attempting to explain gender differences in environmental concern are outdated yet frequently cited. The work presented here provides an exploration into the nuances of gender as a predictor of environmental concern by focusing on the intersections of gender and other socio-demographic variables and exploring the differences in levels of environmental concern not only between men and women but also among men and among women. By providing a thorough exploration of how environmental concern is shaped by gender, hypotheses explaining gender differences in environmental concern are updated as well.

Overall, this study has four significant and overarching conclusions. First, this study confirms the primary finding of Davidson and Freudenburg (1996): women tend to express a greater level of environmental concern than men. This does not appear to have changed over time. All three analytical sections of this study (the systematic

review of literature, the mediating effects of gender and demographic characteristics on environmental concern, and the moderating effects of gender and demographic characteristics on environmental concern) confirm that, in general, women express more concern for the environment than men.

Second, my work contradicts some of Davidson and Freudenburg's (1996) conclusions. Overall, my findings suggest that environmental concern scholars need to revisit the hypotheses that have been established as explanations for the differences between men's and women's environmental concern, and new explanatory factors need to be explored. For example, my work modeling the mediating effects of gender and the presence of children on environmental concern shows that women with and without children are equally concerned about the environment. In light of this, it is difficult to argue that women care more about the environment because they are concerned about the effects of environmental harm on their children.

Third, I find that the differences between the environmental concern of men and women depend on other socio-demographic characteristics, that is other socio-demographic characteristics can magnify the differences between men's and women's environmental concern and gender can operate through other socio-demographic variables. For example, political party affiliation seems to supersede gender in such a way that women who identify as Republicans appear to have the same attitudes about the environment as men who identify as Republicans.

Fourth, there are differences among women and among men as well as differences between men and women. Previous scholars have focused on the differences between the environmental values of men and women, implying that men

and women are homogeneous groups. My findings suggest that this is an oversimplification of gender as a socio-demographic variable.

Answers to the Research Questions

In the first chapter, I posed a question regarding the differences and similarities between and among studies regarding the effects of gender on a variety of measures of environmental concern. To answer this question, I conducted a systematic review of the recent literature on environmental concern. The majority of survey items examined in the systematic review of literature indicate that women tend to express a greater concern for the environment than men, however, many survey items also suggest that there are no significant differences between men's and women's levels of environmental concern.

There are no obvious explanations for the differences in findings related to the design of the studies. Both those studies that reported women having greater levels of environmental concern and those studies that reported no difference between men and women utilized national level samples as well as regional and local level samples. The collective studies had a mix of urban and rural samples and included both small and large sample sizes. In addition, there is no obvious pattern with regard to the type of dataset or survey method used. These findings indicate that the explanations for variations across studies regarding gender differences in levels of environmental concern involve factors that are more complicated than simple discrepancies in survey designs.

I also posed the question of whether or not patterns can be indentified that help explain differences between the environmental concern of men and women. In an effort to better understand the differences between the environmental concern of men and women through the identification of patterns, the measures of environmental concern examined in the systematic review of literature were each categorized into one of eight typologies: (1) support for animal welfare, (2) ecological paradigm, (3) economy versus environment, (4) health and safety concerns, (5) willingness to take personal action to help the environment, (6) support for environmental policy/legislation, (7) trust/belief in the environmental movement, and (8) willingness to pay to protect the environment. Then within four of the categories (ecological paradigm, economy versus environment, health and safety concerns, and support for environmental policy/legislation) survey items were further classified as global (or generic) measures of environmental concern versus local (or specific) measures of environmental concern.

The most conclusive pattern that emerged is that women are more likely to express greater levels of environmental concern than men when issues involve animal welfare. Discussion of animal welfare as a gendered issue has been significantly present in the ecofeminist literature, however, it has been largely absent from the environmental sociology literature at large, including the research on environmental concern. To my knowledge, the pattern of women expressing greater concern for animal welfare than men has not been established in research using quantitative methodologies. Furthermore, the traditional explanations (explored in Davidson and Freudenburg's 1996 review of literature) into why men and women have differing levels of environmental concern (e.g., the health and safety concerns expressed by women,

the competing economic interests of men, and a focus on children for women) do little to explain differences in support for animal welfare. For that reason alone this finding has significant implications; there must be other explanations as to why women are more likely to be concerned with animal welfare than men. Understanding the mechanisms that explain these differences in concern is an important future line of inquiry. In addition, this finding is likely to be of increasing importance since there is mounting public concern for animal welfare as it relates to our current food production systems.

Other patterns (although supported by weaker evidence) also emerged. Women are slightly more likely than men to support the environment over the economy and women are more likely than men to trust or believe in the efforts of the environmental movement. There is also weak evidence to support that men's and women's environmental concern does not differ regarding support for environmental policy or legislation and willingness to pay for environmental protection. Yet the evidence is inconclusive regarding the difference between men's and women's ecological paradigm or worldview, concerns of health and safety issues as they relate to environmental problems, and willingness to take personal action to help protect the environment. Given the findings of Davidson and Freudenburg (1996) and others (see Blocker and Eckberg 1989, 1997; Bord and O'Connor 1997; Marshall 2004; Mohai 1992, 1997; O'Connor, Bord, Yarnal, and Wiefek 2002) who have found consistent support for the *health and safety hypothesis* (that women express greater concern for the environment than men when health and safety risks are considered), the inconclusive finding in my

study regarding men's and women's level of environmental concern when asked about potential health and safety risks is worth noting.

Furthermore, many researchers have suggested that differences in question wording and the type of environmental concern being measured help explain varied findings between men's and women's levels of environmental concern (see Klineberg, McKeever, and Rothenbach 1998). I support this argument, but I believe that it provides only a partial explanation. In my study the evidence for establishing patterns along these grounds tends to be weak or inconclusive. I believe that the exploration of mediating and moderating effects of gender and other socio-demographic correlates of environmental concern can help provide a better understanding of these complex patterns.

Toward this end, I also posed the question of whether or not there are mediating effects between gender and socio-demographic factors with regard to environmental concern. Overwhelmingly, I found evidence for mediated effects between gender and one or more socio-demographic characteristic on several measures of environmental concern: *willingness to pay, growth harms the environment, and progress is dependent on the health of environment*. The effect of gender on willingness to pay is an indirect effect; the effect is fully mediated by belief in evolution in the full model.

In a bivariate model, I find that women are more likely than men to believe that *growth harms the environment*. Yet gender becomes non-significant when years of education, political orientation, and belief in evolution are added to the model. Thus, for example, women are more likely to be Democrats, which in turn is associated with expressing more concern for the environment, so gender is operating through political

orientation and indirectly effects attitudes about growth being harmful to the environment. When women and men have the same education, political orientation, and expressed beliefs in evolution, they have the same attitudes about the effects of growth on the environment, at least as it is measured in the General Social Survey.

Similarly, gender predicts the belief that *progress is dependent on the health of environment* in the bivariate model. Yet gender is fully mediated by a collective group of variables: age, years of education, residential location, number of children, and religious affiliation. Thus, men and women with the same average age, education, type of residence, number of children, and religious affiliation will have the same attitudes about the usefulness of progress in alleviating environmental problems. Overall, given these findings, it is important to remember that gender differences in concerns can be a function of the fact that men and women have different demographic profiles. US women, on average, have higher levels of educational attainment, they make less money, they have different political orientations, they are trained in different fields of study, and they live longer. Thus, it is often these differences—that are arguably gendered—that, in some cases, matter more than gender alone when predicting environmental concern.

Similar to the questions on mediation that I posed in the first chapter, I also posed the question of whether or not there are moderating effects between gender and socio-demographic factors with regard to environmental concern. As with the mediating effect, I found significant interaction effects between gender and various socio-demographic characteristics on a variety of measures of environmental concern. This supports my theoretical assertion that intersectionality cannot be ignored (Collins 1990).

Gender in conjunction with other socio-demographic characteristics has the potential to produced different effects than when gender is considered alone. Such that, for example, it initially seems as if gender is not a significant predictor of *concerned about population growth*; yet there is a gendered effect when white men and women are separated from black men and women, Republican men and women are separated from men and women who are not Republicans, and so forth. Researchers frequently report varied findings regarding differences between men's and women's environmental concern (mostly that women express greater concern for the environment on some measures of environmental concern but on other measures there is no difference between men's and women's environmental concern) and attribute these varied findings to question wording (Dunlap and Jones 2002; Hamilton 2008; Klineberg, McKeever, and Rothenbach 1998). I am suggesting that in addition to this explanation, unexplored interaction effects can mask the differences between men's and women's environmental concern to the extent that what appears in a simpler model as lack of differences in concern is actually more nuanced. .

Finally, the research I presented in this dissertation was designed to determine whether or not mediating and moderating effects are consistent across a couple of datasets using different samples and different measures of environmental concern. Overall, I did not find complete consistency across measures in the General Social Survey and the American National Election Survey. However, given the large numbers of interactions I found, it seems safe to conclude that the relationships between gender and environmental concern are complicated by other socio-demographic factors. The most consistent results were in models testing interactions between gender and race,

gender and political party, and gender and number of children on various measure of environmental concern.

An overwhelming majority of models (all but one) testing interaction effects between gender and race on various measures of environmental concern were significant. I did find evidence to support the *white male effect*, that white men are less concerned about the environment than non-white men, white women, and non-white women (Finucane, Slovic, Mertz, Flynn, and Satterfield 2000; Kalof, Dietz, and Guagnano 2002; Marshall 2004). However, interestingly I found both non-white men and white women to be among the more concerned groups as compared to white men and non-white women. This is in direct contrast to the findings by Finucane, Slovic, Mertz, Flynn, and Satterfield 2000 and Marshall 2004 who found that black women express the greatest amount of environmental concern when compared to other groups (white women, white men, and black men).

I also found consistent support for interaction effects between gender and political party identification. Non-Republican women tend to express the greatest concern for the environment when compared to Republican women, Republican men, and non-Republican men. Given the established relationships between gender and environmental concern and political orientation and environmental concern and the findings that non-Republican women express the greatest level of environmental concern, it is reasonable to expect that Republican men tend to express the lowest levels of environmental concern. My findings, however, suggest that Republican women are frequently less concerned for the environment than non-Republican women and non-Republican men. In fact, I did not find any significant differences in levels of

environmental concern between Republican women and Republican men. These findings suggest that political orientation is a stronger predictor of environmental concern than gender, which lends some support to the findings of Dunlap and McCright 2008 who suggest that political orientation is the most essential socio-demographic predictor of environmental concern. These findings also, however, provide evidence that there are differences among women and among men. That is, Republican women and non-Republican women are not unified in their concern for the environment; Republican women are less likely to be concerned for the environment than are non-Republican women. Based on my results, I caution researchers against thinking of women and men as large homogeneous groups.

Interestingly, I did not find any evidence to support the hypothesis that gender differences in environmental concern are related to the presence or absence of children. I did not find any differences in various measures of environmental concern between men with children and women with children. Nor did I find any differences in multiple measures of environmental concern between women with children and women without children. Davidson and Freudenburg (1996) found that women with children are more concerned about the environment than men with children and women without children; again I did not find evidence for this relationship. I did find the number of children in a household to be a significant predictor of environmental concern in several bivariate models of environmental concern, where people with children are less willing to pay to protect the environment, less willing to sacrifice opportunity costs involved in protecting the environment, and less concerned about population growth than individuals without children. Yet, individuals with children report that they are more likely to help protect the

environment than individuals without children. Nevertheless, it does not seem that these differences are mapped along gender lines nor can they be explained by gender differences in concern for the environment.

Establishing patterns regarding gender among the various measures of environmental concern is not as easy as establishing patterns based on the intersection of gender and other socio-demographic characteristics. Of the 14 measures of environmental concern I used, each model had at least two but no more than four significant interaction effects between gender and another socio-demographic variable. The interesting finding, however, is that only six measures of environmental concern indicated a significant difference between men's and women's levels of environmental concern in the bivariate models, yet all fourteen measures of environmental concern indicated significant differences between men's and women's levels of environmental concern on at least two interaction terms. Thus, previous researchers reporting bivariate findings might report that one measure of environmental concern yielded significant gender differences whereas another did not, suggesting that the type of concern measured is of great importance. I am suggesting, however, that gender differences that are not initially obvious might show up on measures of environmental concern if interaction effects between gender and other socio-demographic characteristics are tested. That is, question wording is important but my findings suggest that interaction effects provide a more powerful explanation into varied findings regarding gender differences in levels of environmental concern.

Recommendations for Future Research

There are four major ways this research can (and should) be extended in the future. First, models testing for three-, four-, and five-way interactions should be utilized. I expanded the current body of research on environmental concern to include two way interactions, yet there is certainly reason to expect three-, four-, and five-way interactions to be significant as well. For example, white women are more likely to express willingness to pay to protect the environment than non-white women but there is probably something economic occurring, as well. Although I controlled for social class, I did not test a three-way interaction between gender, race, and class.

Second, more technical analysis, including age-period-cohort analysis and the use of Geographic Information System (GIS) technology should be employed. Age-group differences are explained by the ages at which people tend to integrate into different social roles. Cohort differences, however, reflect a particular political and social climate over varying historical periods of time. To my knowledge, environmental concern researchers are not utilizing age-period-cohort analysis, which is the most effective way to understand if the varying levels of environmental concern between people of different ages is reflective of age-group differences or cohort differences. Furthermore, there is an increasing trend among environmental demographers to use GIS technology, especially as it relates to migration, neighborhood segregation, and environmental racism (see Crowder and Downey 2010). This technology also has the potential to be extremely beneficial for environmental concern scholars as it relates to place of residence, proximity to polluting facilities, and concern for the environment. Of course, I advocate for the use of age-period-cohort analysis and GIS technology to

expand our understanding of the complex relationships between age, place of residence, and gender.

Third, as international research on environmental concern expands, I advocate the use of an intersectionality theoretical perspective as well as statistical modelling that tests for mediating and moderating effects. That is, can my results be replicated using the International Social Survey Programme? Fourth, there is a need to better integrate quantitative research and feminist theory. For example, although intersectionality is a major theme among feminist theorists, interaction models are not frequently associated with feminist theories or methodologies. I believe, as I have demonstrated through this study, that quantitative research, including complex statistical modeling, has a place in feminist research.

REFERENCES

Abbey, E. (1975). *The monkey wrench gang*. New York, NY: HaperCollins Publishers.

Adams, C. J. (1990). *The sexual politics of meat: A feminist-vegetarian critical theory*. New York, NY: The Continuum International Publishing Group Inc.

Adams, C. J. (2003). *The pornography of meat*. New York, NY: The Continuum International Publishing Group Inc.

Adams, C. J. & Donovan J. (1995). *Animals and women: Feminist theoretical explorations*. Durham, NC: Duke University Press

Banerjee, D., & Bell, M. M. (2007). Ecogender: Constructing gender in environmental social sciences. *Society and Natural Resources*, 20(1), 3-19.

Barreto, M. A. & Bozonelos, D. (2009). Democrat, Republican, or none of the above? The role of religiosity in Muslim American party identification. *Politics and Religion*, 1-31.

Bell, M. M. (2004). *An invitation to environmental sociology* (2nd ed.). Thousand Oaks, CA: Pine Forge Press.

Blocker, T. J., & Eckberg, D. L. (1989). Environmental issues as women's issues: General concern and local hazards. Social Science Quarterly, 70(3), 586-593.

Blocker, T. J., & Eckberg, D. L. (1997). Gender and environmentalism: Results from the 1993 General Social Survey. *Social Science Quarterly*, 78(4), 841-858.

Bohon, S. A., & Humphrey, C. R. (2000). Courting LULUs: Characteristics of suitor and objector communities. *Rural Sociology,* 65(3), 376-395.

Bord, R. J. & O'Connor, R. E. (1992). Determinants of risk perceptions of a hazardous waste site. *Risk Analysis*. 12(3), 411-416.

Bord, R. J. & O'Connor, R. E. (1997). The gender gap in environmental attitudes: The case of perceived vulnerability to risk. Social Science Quarterly. 78(4), 830-840.

Boyd, H. H. (1999). Christianity and the environment in the American public. *Journal for the Scientific Study of Religion*, 38(1), 36-44.

Brody, C. J. (1984). Difference by sex in support for nuclear power. *Social Forces*, 63(1), 209-228.

Brody, J. G., & Fleishman, J. K. (1993). Sources of public concern about nuclear waste disposal in Texas agricultural communities. In R. E. Dunlap, M. E. Kraft, & E. A. Rosa (Eds.), *Public reactions to nuclear waste: Citizens' views of repository sitting* (pp. 115-135). Durham, NC: Duke University Press.

Brody, S. D., Zahran, S., Vedlitz, A., & Grover, H. (2008). Examining the relationships between physical vulnerability and public perceptions of global climate change in the United States. *Environment and Behavior*, 40(1), 72-95.

Brulle, R. J. (1996). Environmental discourse and social movement organizations: A historical and rhetorical perspective on the development of US environmental organizations. In R. S. Frey (Ed.), *The environment and society reader* (217-237). Boston, MA: Allyn and Bacon.

Bullard, R. D. (1990). *Dumping in Dixie: Race, class, and environmental quality.* Boulder, CO: Westview Press.

Carson, R. (1962). *Silent spring*. Boston, MA: Houghton Mifflin.

Cherlin, A. J. (2009). *The marriage-go-round: The state of marriage and the family in America today*. New York, NY: Alfred A. Knopf.

Collins, P. H. (1990, 2000). *Black feminist thought: Knowledge, consciousness and the politics of empowerment*. New York: Routledge.

Collins, P. H. (1998). *Fighting words: Black women and the search for justice*. Minneapolis, MN: University of Minnesota Press.

Crowder, K. & Downey, L. (2010). Interneighborhood migration, race, and environmental hazards: Modleing microlevel processes of environmental inequality. *American Journal of Sociology*, 115(4), 1110-1149.

Daly, M. (1978). Gyn/Ecology: The metaethics of radical feminism. Boston, MA: Beacon Press.

Danigelis, N. L., Hardy, M., and Cutler, S. J. (2007). Population aging, intracohort aging, and sociopolitical attitudes. *American Sociological Review*, 72, 812-830.

Davidson, D. J., & Freudenburg, W. R. (1996). Gender and environmental risk concerns: A review and analysis of available research. *Environment and Behavior* 28(3): 302-339.

Deemer, D. R. & Lobao, L. M. (2011). Public concern with farm-animal welfare: Religion, politics, and human disadvantage in the food sector. Forthcoming in *Rural Sociology*.

Dietz, T., Dan, A., & Shwom, R. (2007). Support for climate change policy: Social psychological and social structural influences. *Rural Sociology*, 72(2), 185-214.

Dietz, T., Fitzgerald, A., & Shwom, R. (2005). Environmental values. *Annual Review of Environmental Resources*, 30, 335-372.

Dunlap, R. E. & Catton, W. R. (1979). Environmental sociology. *Annual Review of Sociology*, 5, 243-273.

Dunlap, R. E. & Jones, R. E. (2002). Environmental concern: Conceptual and measurement issues. In R.E. Dunlap & W. Michelson (Eds.), *Handbook of Environmental Sociology* (482-524). Westport, CN: Greenwood Press.

Dunlap, R. E. & McCright, A. (2008). A widening gap: Republican and Democratic views on climate change. *Environment*, 50, 26-35.

Dunlap, R. E., & Marshall, B. K. (2006). Environmental Sociology. In C. D. Bryant and D. L. Peck (Eds.), *21st Century Sociology: A Reference Handbook* (329-340). Thousand Oaks, CA: Sage Publications, Inc.

Dunlap, R. E., Rosa, E. A., Baxter, R. K., & Mitchell, R. C. (1993) Local attitudes toward sitting a high-level nuclear waste repository at Hanford, Washington. In R. E. Dunlap, M. E. Kraft, & E. A. Rosa (Eds.), *Public reactions to nuclear waste: Citizens' views of repository sitting* (pp. 136-172). Durham, NC: Duke University Press.

Dunlap, R. E., & Van Liere, K. D. (1978). The new environmental paradigm: A proposed measuring instrument and preliminary results. *Journal of Environmental Education,* 9, 10-19.

Dunlap, R. E., & Van Liere, K. D. (1984). Commitment to the dominant social paradigm and concern for environmental quality. *Social Science Quarterly,* 65, 1013-1028.

Dunlap, R. E., Van Liere, K. D., Mertig, A., & Jones, R. E. (2000). Measuring endorsement of the New Ecological Paradigm: A revised NEP scale. *Journal of Social Issues* 56(3): 425-442.

Dunlap, R. E., Xiao, C., & McCright, A. M. (2001). Politics and environment in America: Partisan and ideological cleavages in public support for environmentalism. *Environmental Politics*, 10(4), 23-48.

Edlund, L., & Pande, R. (2002). Why have women become left-wing? The political gender gap and the decline in marriage. *The Quarterly Journal of Economics*, 117(3), 917-961.

Finucane, M. L., Slovic, P., Mertz, C. K., Flynn, J., and Satterfield, T. A. (2000). Gender, race, and perceived risk: The 'white male' effect. *Health, Risk & Society,* 2(2), 159-172.

Fransson, N., & Garling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology*, 19, 369-382.

Gaard, G. (1998). Ecological politics: Ecofeminists and the greens. Philadelphia, Temple University Press.

Gilligan, C. (1982). In a different voice: Psychological theory and women's development. Boston, MA: Harvard University Press.

The Green Bible (New Revised Standard Version). (2008). New York, NY: HarperCollins Publisher.

Griffin, S. (1978). Women and nature: The roaring inside her. New York: HarperCollins Publishers.

Guagnano, G. A. & Markee, N. (1995). Regional differences in the sociodemographic determinates of environmental concern. *Population and Environment*, 17(2), 135-149.

Hamilton, L. C. (2006). *Statistics with STATA: Updated for version 9*. Belmont, CA: Thomson.

Hamilton, L. C. (2008). Who cares about polar regions? Results from a survey of U.S. public opinion. *Arctic, Antarctic, and Alpine Research*, 40(4), 671–678.

Hamilton, L. C. (2009). Education, politics, and opinions about climate change: Evidence for interaction effects. Forthcoming in *Climate Change*.

Hamilton, L. C. (2010). Education, politics and opinions about climate change: Evidence for interaction effects. Forthcoming in *Climate Change.*

Hamilton, L. C., Colocousis, C. R., & Duncan, C. M. (2010). Place effects on environmental views. *Rural Sociology*, 75(2), 326-347.

Hamilton, L. C. & Keim, B. (2009) Regional variation in perceptions about climate change. *International Journal of Climatology,* 10, 1002.

Harding, S. (1990). Feminism, science, and the anti-enlightenment critiques. In L. Nicholson (Ed.), *Feminism/ postmodernism: Thinking gender* (pp. 83-106). London: Routledge.

Hartmann, H. (1997). The unhappy marriage of Marxism and feminism: Towards a more progressive union. In L. Nicholson (Ed.), *The second wave: A reader in feminist theory* (pp. 97-122). New York: Routledge.

Hernandez, D. (2005). Changes in the demographics of families over the course of American history. In J. Heymann & C. Beem (Eds.), *Unfinished work: Building equality and democracy in an era of working families* (13-35). New York: The New Press.

Hoban, T., Woodrum, E., & Czaja, R. (1992). Public opposition to genetic engineering. *Rural Sociology*, 57(4), 476-493.

Johnson, E. A. (2007). *Quest for the living God: Mapping frontiers in the theology of God*. New York, NY: Continuum.

Jones, R. E. (1998). Black concern for the environment: Myth versus reality. *Society & Natural Resources,* 11(2), 1-20.

Jones, R. E. (2002). Blacks just don't care: Unmasking popular misconceptions about concern for the environmental among African-Americans. *International Journal of Public Administration,* 25(2).

Jones, R. E. & Carter, L. F. (1994). Concern for the environment among black Americans: An assessment of common assumptions. *Social Science Quarterly*, 75(3), 560-579.

Jones, R. E., & Dunlap, R. E. (1992). The social bases of environmental concern: Have they changed over time? *Rural Sociology,* 57(1), 28-47.

Jones, R. E., Fly, J. M., Talley, J., & Cordell, H. K. (2003) Green migration into rural America: The new frontier of environmentalism. *Society & Natural Resources,* 16(3), 221-228.

Jones, R. E. & Rainey, S. A. (2006). Examining linkages between race, environmental concern, health, and justice in highly a polluted community of color. Journal of Black Studies, 36, 473-496.

Kalof, L., Dietz, T. & Guagnano, G. (2002). Race, gender, and environmentalism: The atypical values and beliefs of white men. *Race, Gender & Class*, 22(9), 112.

Kalof, L. & Satterfield, T. (Eds.) (2005). *The Earthscan reader in environmental values.* London: Earthscan.

Kimmel, M.S. (2011). *The gendered society (4th Ed.)*. New York: Oxford University Press, Inc.

King, Y. (1990). Healing the wounds: Feminism, ecology, and the nature/ culture dualism. In I. Diamond & G. F. Orenstein (Eds.), *Reweaving the world: The emergence of ecofeminism* (160-121). San Francisco, CA: Sierra Club Books.

Klineberg, S. L., McKeever, M., & Rothenbach, B. (1998). Demographic predictors of environmental concern: It does make a difference how it's measured. *Social Science Quarterly*, 79(4), 734-753.

Kozol, J. (1991). *Savage inequalities: Children in America's schools*. New York: Harper Collins Publishing.

Krosnick, J. A., Holbrook, A.L., Lowe, L., & Visser P. S. (2006) The origins and consequences of democratic citizens' policy agendas: A study of popular concern about global warming. *Climatic Change,* 10, 906.

Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climate Change*, 77, 45-72.

Lorenzoni, I. & Pidgeon, N. F. (2006) Public views on climate change: European

and USA perspectives. *Climatic Change,* 77(1–2), 73–95.

Lyons, E., & Breakwell, G. M., (1994). Factors predicting environmental concern and indifference in 13-to-16 year-olds. *Environment and Behavior*, 26(2), 223-238.

Marshall, B. K. (2004). Gender, race, and perceived environmental risk: The "white male" effect in Cancer Alley, LA. *Sociological Spectrum*, 24, 453-478.

Maslow, A. (1970). Motivation and personality (2nd Ed.). New York: Viking Press.

McCright, A. M. & Dunlap, R. E. (2000). Challenging global warming as a social problem: An analysis of the conservative movement's counter-claims. *Social Problems*, 47(4), 499-522.

McCright, A. M. & Dunlap, R. E. (2003). Defeating Kyoto: The conservative movement's impact on U.S. climate change policy. *Social Problems*, 50(3), 348-373.

McCright, A. M. & Dunlap, R. E. (2008). Social movement identity and belief systems: An examination of beliefs about environmental problems within the American public. Public Opinion Quarterly, 72(4), 651-676.

Mckelvey, W., Brody, J. G., Aschengrau, A., & Swartz, C. H. (2003). Association between residence on Cape Cod, Massachusetts, and breast cancer. New York: Elsevier, Inc.

Mellor, M. (1997). Gender and the environment. In M. Redclift & G. Woodagate (Eds.), *The international handbook of environmental sociology* (195-201). UK: Edward Elgar Publishing.

Merchant, C. (1980). *The death of nature: Women, ecology, and the scientific revolution.* New York: Harper Collins Publishers.

Mies, M. & Shiva, V. (1993). *Ecofeminism*. New York: Zed Books.

Mishel, L., Bernstein, J., & Shierholz, H. (2008-2009). *The State of Working America.* An Economic Policy Institute Book. Ithaca, NY: ILR Press, an imprint of Cornell University Press.

Mohai, P. (1992). Men, women, and the environment: An examination of the gender gap in environmental concern and activism. *Society and Natural Resources*, 4(1), 1-19.

Mohai, P. (1997). Gender differences in the perception of most important environmental problems. *Race, Gender & Class*, 5(1), 153.

Mohai, P. & Bryant, B. (1998). Is there a “race” effect on concern for environmental quality? *The Public Opinion Quarterly*, 62(4), 475-505.

Nisbet, M. & Myers, T. (2007). The polls-trends: Twenty years of public opinion about global warming. *Public Opinion Quarterly*, 17(3), 444-470.

O’Connor, R. E., Board, R. J., & Fisher, A. (1999). Risk perceptions, general environmental beliefs, and willingness to address climate change. *Risk Analysis*, 19(3), 461-471.

O’Connor, R. E., Bord, R. J., Yarnal, B., & Wiefek, N. (2002). Who wants to reduce greenhouse gas emissions? *Social Science Quarterly*, 83(1), 1-17.

Olofsson, A. & Öhman, S. (2006) General beliefs and environmental concern: Transatlantic comparisons. *Environment and Behavior*, 38:768–790.

Piven, F. F. & Cloward, R. A. (2000). *Why Americans still don't vote: And why politicians want it that way*. Boston, MA: Beacon Press.

Satterfield, T. & Kalof, L. (2005). Environmental values: An introduction – Relativistic and axiomatic traditions in the study of environmental values. In L. Kalof & T. Satterfield (Eds.), *The Earthscan reader in environmental values.* London: Earthscan.

Schahn, J. & Holzer, E. (1990). Studies of individual environmental concern: The role of knowledge, gender, and background variables. *Environment and Behavior*, 22(6), 767-786.

Shiva, V. (1989). *Staying alive: Women, ecology and development*. London: Zed Books

Shwom, R., Dan, A., & Dietz, T. (2008) The effects of information and state of residence on climate change policy preferences. *Climatic Change*, 90:343–358.

Singleton, R. A., Straits, B. C., (2005). *Approaches to social research*, 4th ed. New York: Oxford University Press.

Sleeth, M. (2007). *Serve God, save the planet: A christian call to action*. Grand Rapids, MI: Zondervan.

Slimak, M. W. & Dietz, T. (2006). Personal values, beliefs, and ecological risk perception. *Risk Analysis*, 26(6), 1689-1705.

Slovic, P., Flynn, J., & Gregory, R. (1994). Stigma happens: Social problems in the sitting of nuclear waste facilities. *Risk Analysis*, 14(5), 773-777.

Solomon, L. S., Tomaskovic-Devey, D., Risman, B. J. (1989). The gender gap and nuclear power: Attitudes in a politicized environment. *Sex Roles*, 21(5-6), 401-414.

Smith, S. (2005). *Women and socialism: Essays on women's liberation*. Chicago, IL: Haymarket Books.

Stern, P. C., Dietz, T. & Kalof, L. (1993) Value orientations, gender and environmental concern. In L. Kalof & T. Satterfield (Eds.), *The Earthscan reader in environmental values* (188-206). London: Earthscan.

Stout-Wiegand, N., & Trent, R. B. (1983). Sex differences in attitudes toward new energy resource development. *Rural Sociology*, 48(4), 637-646.

Thomas, J. E., & Kukulan, A. (2004). Why don't I know about these women?: The integration of early women sociologist in classical theory courses. *Teaching Sociology*, 32(3), 252-263.

Uyeki, E. S. & Holland, L. J. (2000). Diffusion of pro-environment attitudes? *American Behavioral Scientist*, 43(4), 646-662.

Van Liere, K. D. & Dunlap, R. E. (1980). The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. *Public Opinion Quarterly* 44: 181-197.

Vogel, L. (1983). *Marxism and the oppression of women: Toward a unitary theory.* New Brunswick, NJ: Rutgers University Press.

Warren, K. J. (2000). *Ecofeminist philosophy: A Western perspective on what it is and why it matters*. Lanham, MD: Rowman and Littlefield Publishers, Inc.

Wilkinson, R. C. & Freudenburg, W. R. (Eds.) (2008). *Equity and the environment*. Boston, MA: Elsevier.

Zelezny, L. C., Chua, P-P, & Aldrich, C. (2000). Elaborating on gender differences in environmentalism. *Journal of Social Issues*, 56(3), 443-457.

APPENDIX

Table A.1 Typology of Survey Items in Systematic Review of Literature

Measure of Environmental Concern	Typology	Global (Generic)/ Local (Specific)
Believes in animal rights (bivariate)	Animal welfare	
Believes in animal rights (multivariate)	Animal welfare	
Pro-animal orientation	Animal welfare	
Concern for polar bears becoming extinct	Animal welfare	
Concern for Arctic seals being threatened	Animal welfare	
Believes human actions (scientific/economic) hurt nature (bivariate)	Ecological paradigm	Global (Generic)
Considers nature to be sacred (bivariate)	Ecological paradigm	Global (Generic)
Global warming as an ecological risk	Ecological paradigm	Global (Generic)
Seriousness of global warming as problem (reduced model)	Ecological paradigm	Global (Generic)
Support for environment	Ecological paradigm	Global (Generic)
Global warming poses serious threat in lifetime (New Hampshire residents)	Ecological paradigm	Global (Generic)
Global warming poses serious threat in lifetime (Michigan residents)	Ecological paradigm	Global (Generic)
Environmental beliefs - based on NEP model	Ecological paradigm	Global (Generic)
Ecological worldview	Ecological paradigm	Global (Generic)
Global warming risk perception (reduced model)	Ecological paradigm	Global (Generic)
Global warming risk perception (full model)	Ecological paradigm	Global (Generic)
Perceived seriousness of nature preservation issues, such as loss of wildlife (bivariate)	Ecological paradigm	Global (Generic)
Perceived seriousness of nature preservation issues, such as loss of wildlife (multivariate)	Ecological paradigm	Global (Generic)
Perceived seriousness of global environmental problems (bivariate)	Ecological paradigm	Global (Generic)
Awareness/ perception of climate change risk	Ecological paradigm	Global (Generic)
Believes human actions (scientific/economic) hurt nature (multivariate)	Ecological paradigm	Global (Generic)
Considers nature to be sacred (multivariate)	Ecological paradigm	Global (Generic)
Seriousness of global warming as problem (full model)	Ecological paradigm	Global (Generic)
New Ecological Paradigm	Ecological paradigm	Global (Generic)
Extent you worry about environmental problems	Ecological paradigm	Global (Generic)
Perceived seriousness of global environmental problems (multivariate)	Ecological paradigm	Global (Generic)
Ecological risk scale (e.g. concern for wetland loss)	Ecological paradigm	Global (Generic)
Global risk scale (e.g. concern for population growth)	Ecological paradigm	Global (Generic)
Pro-environment orientation	Ecological paradigm	Global (Generic)
Hazardous waste sites as an ecological risk	Ecological paradigm	Local (Specific)

Table A.1 Typology of Survey Items in Systematic Review of Literature

Measure of Environmental Concern	Typology	Global (Generic)/ Local (Specific)
Concern for Inuit losing their traditional way of life	Ecological paradigm	Local (Specific)
Self-identify as environmentalist	Ecological paradigm	Local (Specific)
Concern for sea level rising	Ecological paradigm	Local (Specific)
Concern for northern ice cap melting	Ecological paradigm	Local (Specific)
Concern for preserving Antarctica	Ecological paradigm	Local (Specific)
Perceived seriousness of neighborhood environmental problems (bivariate)	Ecological paradigm	Local (Specific)
Perceived seriousness of neighborhood environmental problems (multivariate)	Ecological paradigm	Local (Specific)
Biological risk scale (e.g. concern for GMOs)	Ecological paradigm	Local (Specific)
Believes economy takes precedence over the environment (multivariate)	Environment v. economy	Global (Generic)
Economy vs. environment tradeoffs	Environment v. economy	Global (Generic)
Less growth orientation	Environment v. economy	Global (Generic)
Believes economy takes precedence over the environment (bivariate)	Environment v. economy	Global (Generic)
Use natural resources to create jobs or conserve natural resources for future generations?	Environment v. economy	Local (Specific)
Has urban sprawl or rapid development had effect on your family/community?	Environment v. economy	Local (Specific)
Perceived seriousness of pollution (bivariate)	Health/safety	Global (Generic)
Perceived seriousness of pollution (multivariate)	Health/safety	Global (Generic)
Worries about effects of pollution (bivariate)	Health/safety	Global (Generic)
Worries about effects of pollution (multivariate)	Health/safety	Global (Generic)
Global warming as a health risk	Health/safety	Global (Generic)
Seriousness of hazardous waste sites as problem (reduced model)	Health/safety	Global (Generic)
How dangerous are environmental hazards	Health/safety	Global (Generic)
Concern for state-wide pollution	Health/safety	Global (Generic)
Chemical risk scale (e.g. concern for hazardous waste sites)	Health/safety	Global (Generic)
Seriousness of hazardous waste sites as problem (full model)	Health/safety	Global (Generic)
Hazardous waste sites as a health risk	Health/safety	Local (Specific)
Perceived risk from nuclear power plants	Health/safety	Local (Specific)
Perceived risk from stored nuclear waste	Health/safety	Local (Specific)
Perceived risk from lead in dust or paint	Health/safety	Local (Specific)
Perceived risk from natural disasters	Health/safety	Local (Specific)
Perceived risk from coal/ oil burning power plants	Health/safety	Local (Specific)
Perceived risk from pesticides	Health/safety	Local (Specific)

Table A.1 Typology of Survey Items in Systematic Review of Literature

Measure of Environmental Concern	Typology	Global (Generic)/ Local (Specific)
Perceived risk from hormones/antibiotics in meat	Health/safety	Local (Specific)
Perceived risk from pesticides in food	Health/safety	Local (Specific)
Perceived risk from crops genetically engineered	Health/safety	Local (Specific)
Concern for local pollution	Health/safety	Local (Specific)
Perceived seriousness of air pollution (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of illness from industry (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of industry being too close (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of odors from industry (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of water pollution (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of air pollution (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of hazardous waste disposal (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of illness from industry (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of industry being too close (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of odors from industry (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of toxic chemical leaks (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of pollution from waste (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of plumes of smoke (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of flames from stacks (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of noise from industry (no industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of water pollution (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of hazardous waste disposal (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of toxic chemical leaks (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of pollution from waste (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of plumes of smoke (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of flames from stacks (industrial plant in community)	Health/safety	Local (Specific)
Perceived seriousness of noise from industry (industrial plant in community)	Health/safety	Local (Specific)
Engages in personal green activities (multivariate)	Personal action	
Have a green lifestyle (bivariate)	Personal action	
Have a green lifestyle (multivariate)	Personal action	
Likeliness to take voluntary action to address global warming (reduced model)	Personal action	
Likeliness to take voluntary action to address hazardous waste sites (reduced model)	Personal action	
Likeliness to take voluntary action to address hazardous waste sites (full model)	Personal action	

Table A.1 Typology of Survey Items in Systematic Review of Literature

Measure of Environmental Concern	Typology	Global (Generic)/ Local (Specific)
Participate in green behaviors	Personal action	
Participate in pro-environment behaviors	Personal action	
Voluntary action (e.g. carpool; full model)	Personal action	
Engages in personal green activities (bivariate)	Personal action	
Participates in organized green activities (bivariate)	Personal action	
Participates in organized green activities (multivariate)	Personal action	
Likeliness to take voluntary action to address global warming (full model)	Personal action	
Membership in environmental organization	Personal action	
Willingness to select clean energy option from power company	Personal action	
Willingness to buy green products	Personal action	
Willingness to suffer discomfort to help environment	Personal action	
Willingness to drive less	Personal action	
Voting intentions (e.g. vote for gas tax; full model)	Policy/legislation	Global (Generic)
Support policies to address global warming (full model)	Policy/legislation	Global (Generic)
Support policies to address global warming (reduced model)	Policy/legislation	Global (Generic)
Voting intentions (e.g. vote for gas tax)	Policy/legislation	Global (Generic)
Approves gov. regulation to protect the environment (bivariate)	Policy/legislation	Global (Generic)
Approves gov. regulation to protect the environment (multivariate)	Policy/legislation	Global (Generic)
Support for environmental policies	Policy/legislation	Global (Generic)
Trust business/politicians to protect environment	Policy/legislation	Global (Generic)
Responsibility to fix environment is w/ business & government - not me	Policy/legislation	Global (Generic)
How are local climate-change effects perceived	Policy/legislation	Local (Specific)
Effect of environmental rules that restrict development on your community	Policy/legislation	Local (Specific)
Trust in environmentalists	Trust/belief	
View of goals of the environmental movement	Trust/belief	
Relationship w/ the environmental movement	Trust/belief	
Evaluation of environmental movement	Trust/belief	
Trust in national environmental organizations	Trust/belief	
Trust in local environmental organizations	Trust/belief	
Perceived impact of the environmental movement	Trust/belief	
Support higher taxes to address climate change (reduced model)	Willingness to Pay	
Is willing to bear costs to protect the environment (bivariate)	Willingness to Pay	

Table A.1 Typology of Survey Items in Systematic Review of Literature

Measure of Environmental Concern	Typology	Global (Generic)/ Local (Specific)
Is willing to bear costs to protect the environment (multivariate)	Willingness to Pay	
Willingness to spend money for environment	Willingness to Pay	
Support higher taxes to address climate change (full model)	Willingness to Pay	

Table A.2 Distribution of Responses for Feelings toward Environmentalists Dependent Variable - Display of Digit Preference

Feeling Thermometer	Frequency	Percent
0	28	1.39
4	1	0.05
6	1	0.05
10	1	0.05
15	34	1.69
20	1	0.05
30	49	2.44
35	2	0.1
40	126	6.27
42	1	0.05
45	1	0.05
50	339	16.86
55	2	0.1
59	1	0.05
60	329	16.36
63	1	0.05
65	5	0.25
70	446	22.18
75	12	0.6
80	23	1.14
85	361	17.95
89	1	0.05
90	12	0.6
95	1	0.05
98	2	0.1
100	231	11.49
Total	2,011	100

Table A.3a Regression Coefficients for Bivariate Results - GSS Models

	Male		Age		White		Low class		Years of education		Republican	
Willingness to pay	.134	**	-.004	**	.048		-.200	***	.043	***	-.121	*
Environmental problems are dangerous	-.054		-.002		-.157	**	-.009		.007		-.227	***
Opportunity cost	.016		-.377	***	.277	***	-.117	**	.068	***	-.071	
Reliance on science	-.380	**	.007	*	.320	*	-.139		.090	***	.216	
Modern life harms the environment	-.057		-.006		-.173		.217	*	-.067	**	-.418	**
Economic growth protects the environment	.016		-.002		.414	**	-.078		.050	*	-.044	
Growth harms the environment	-.251	*	-.001		-.505	***	.268	*	-.150	***	-.417	**
Concerned about population growth	.110		.004		.444	**	-.086		.007		-.257	*
Progress is dependent on the health of environment	-.269	*	.009	*	-.365	*	.164		-.058	**	-.470	***
Likelihood of damage from a nuclear accident	-.583	***	.004		-.653	***	.259	*	-.092	***	-.516	***
I help the environment	-.053		.017	***	-.012		-.182		.055	**	.082	

* p<.05 ** p<.01 *** p<.001

Italicized variables represent non-parametric regression models

Table A.3b Regression Coefficients for Bivariate Results - GSS Models

	Reside in urban setting		Ever been married		No. of children		Religious		Believe in evolution	
Willingness to pay	.049		-.190	**	-.054	***	-.234	**	.169	**
Environmental problems are dangerous	.146	**	-.070		-.013		-.168	*	.134	**
Opportunity cost	.067		-.113	*	-.071	***	-.221	***	.150	***
Reliance on science	.013		.066		.001		.030		-.218	
Modern life harms the environment	.086		-.172		-.016		-.035		.187	
Economic growth protects the environment	.022		-.024		-.044		-.200		-.027	
Growth harms the environment	.047		-.261	*	-.004		.058		-.017	
Concerned about population growth	.013		-.114		-.094	**	-.665	***	.714	***
Progress is dependent on the health of environment	-.016		-.019		.059		.105		-.011	
Likelihood of damage from a nuclear accident	.102		-.121		.008		-.057		.143	
I help the environment	-.115		.206		.080	*	.093		.203	

* p<.05 ** p<.01 *** p<.001

Italicized variables represent non-parametric regression models

Table A.4a Regression Coefficients for Bivariate Results - ANES Models

	Male	Age	White	Low and working class	Educational attainment
Feelings toward environmentalists	-5.165 ***	-.021	-8.424 ***	2.118 *	.295
Lower power plant emissions	.113	-.006	.335 **	-.154	.137 **
Support for gas tax	.136	.001	-.079	-.393 **	.048

* p<.05 ** p<.01 *** p<.001

Italicized variables represent non-parametric regression models

Table A.4b Regression Coefficients for Bivariate Results - ANES Models

	Republican thermometer	Reside in urban setting	Ever been married	Religious
Feelings toward Environmentalists	-.127 ***	2.665 *	-1.949	.557
Lower power plant emissions	-.005 *	-.087	-.149	-.192
Support for gas tax	-.004	.146	-.235	-.600 ***

* p<.05 ** p<.01 *** p<.001

Italicized variables represent non-parametric regression models

VITA

Carmel Price is from Rutherfordton, NC, home of the RS Central Hilltoppers. She graduated with a Bachelor of Arts from the University of North Carolina at Chapel Hill in May 2000. Carmel double majored in elementary education and psychology and is a licensed K-6 teacher. She served two-years in AmeriCorps before moving to New Orleans, LA to pursue a career in social work. Carmel graduated in December 2003 from Tulane University in New Orleans with a MSW. Carmel worked as a licensed social worker for several years, primarily in the area of gender-based violence. She then began the PhD program at the University of Tennessee at Knoxville focusing on environmental sociology and gender and working as a Graduate Teaching Associate for the Department of Sociology and the Chancellor's Honors Program. She lives with her husband, Patrick Sanderson, their two dogs, Nina and Bobbie, two cats, Togo and Mali, and their newborn son, Owen Clarke Sanderson-Price.