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**Fay, Leann M. *Demographic Factors and Expressions of Environmentalism***

**Abstract**

Previous research has linked various demographic characteristics with environmentalism. There have been many misconceptions that certain groups, such as those in higher income brackets, are more concerned about the environment than others. There is evidence, however, that groups assumed to be less concerned are expressing environmentalism in a different way. This study looks at how demographic factors influence different types of environmentalist expression. Results suggest that if relationships are drawn between specific demographic groups and environmental expression, results can be used to target potential constraints influencing environmentalism.

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## **Chapter I: Introduction**

There are many ways that individuals express concern for the environment, especially in a time when it seems critical to take environmental action (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Environmental activists rally in protests, sign petitions, challenge organizational and government policy, and become devoted members of environmental groups. These displays of environmental concern are in the public spotlight, but there are many other displays of environmental expression such as home recycling and the desire to have the government get involved in protecting the environment that are equally important to the environmental movement (Mohai, 1992).

### **Statement of the Problem**

The Value-Belief-Norm Theory (Stern et al. 1999) explains that individuals will experience the norm to take environmental action if their values coincide with the cause, and they believe there is a need to protect the environment and their actions make a difference. The theory further suggests that the type of action individuals take is dependent on their capabilities and constraints. The present study proposes that demographic factors such as gender, income, and education will influence an individual's capabilities and constraints, thereby influencing the type of environmental action an individual will take. Individuals may express environmentalism in many different ways such as expressing concern for the environment, having a willingness to pay money to protect the environment, engaging in pro-environmental behavior, engaging in activism, and desiring the government to play a larger role in protecting the environment.

### **Concern for the Environment**

The first of these expressions, concern for the environment, has been shown to differ based on gender, income, and education. Various studies have suggested that females express

higher levels of environmental concern than males (Mohai, 1992; O'Shaughnessy & Kennedy, 2010; Woodrum & Wolkomir, 1997). In a study of environmental concern in West Germany, females worried more than males about conserving the environment (Engel & Potschke, 1998). There may be a dominant view that income is positively related to environmental concern, but research by Mohai (1985) refutes this misconception by showing that individuals in the lower class are just as concerned about environmental problems, but are constrained from engaging in political activism because of fewer resources and lower self-efficacy. Similarly, education appears to have a relationship with environmental concern. In a study of citizens in Oman, individuals with more education had greater knowledge about the environment, higher attitudes regarding the environment, and were more concerned about the environment than less educated individuals (Abdul-Wahab & Abdo, 2010).

In addition to the evidence that concern for the environment differs based on gender, income, and education, there is evidence that the Value-Belief-Norm Theory is useful in explaining concern for the environment. A study by Oreg and Katz-Gerro used the Value-Belief-Norm Theory to predict pro-environmental behavior and environmental concern (2006). Results showed that postmaterialistic values, defined as self-expression values an individual may have once basic needs are met, influence environmental concern, which affected a variety of pro-environmental behaviors (Oreg & Katz-Gerro, 2006). This may indicate that the Value-Belief-Norm Theory will help explain concern for the environment as an expression of environmentalism.

### **Willingness to Pay Money to Protect the Environment**

Willingness to pay money to protect the environment has been proven to be related to gender, income, and education. The International Social Survey in 1993 showed that willingness

to pay money to protect the environment was most strongly related to the tendency to act consistently with one's values (Engel & Potschke, 1998). The study demonstrated that individual characteristics such as gender, income, and education are closely tied to the relationship between value-action consistency and willingness to pay. Females were less willing to pay higher prices and taxes to protect the environment than males. However, housewives were more willing to accept higher prices than employed women (Engel & Potschke, 1998). Another study demonstrated the paradox that although women express greater environmental concern than men, they are less willing to pay money to protect the environment (Woodrum & Wolkomir, 1997). Positive relationships have also been found between income and willingness to pay money to protect the environment (Ezebilo, Mattsson, & Afolami, 2010; Halkos & Matsiori, 2012). In addition, various studies confirm there is a positive relationship between education and willingness to pay money to protect the environment (Engel & Potschke, 1998; Ezebilo et al., 2010). For example, in central Greece, citizens' willingness to pay for coastal zone improvement increased 11% for every year of education attained (Halkos & Matsiori, 2012).

In addition to the evidence that willingness to pay money to protect the environment differs based on gender, income, and education, there is evidence that the Value-Belief-Norm Theory is useful in explaining willingness to pay. For example, the Value-Belief-Norm Theory was used in one study to predict willingness to pay for a suburban park. This research revealed that positive attitudes, altruistic values and pro-environmental beliefs influenced park visitors' willingness to pay (Lopez-Mosquera & Sanchez, 2012). This demonstrates the Value-Belief-Norm Theory's ability to explain the expression of environmentalism, willingness to pay money to protect the environment.

### **Pro-environmental Behavior**

Pro-environmental behavior has proven to be more complex to predict based on gender, income, and education. Some studies have revealed that females are more likely to engage in pro-environmental behavior, such as recycling, than males (Lang, 2011; Woodrum & Wolkomir, 1997). A study conducted of Omani citizens showed that Omani men displayed more environmental friendly behaviors than women. However, the authors hypothesized that culture and tradition most likely influenced the observed gender differences (Abdul-Wahab & Abdo, 2010). Income has been demonstrated to have a strong positive relationship with pro-environmental behavior (Lang, 2011; Woodrum & Wolkomir, 1997). When eight Bhutan villages were studied, economic wealth predicted an increase in pro-environmental behaviors such as sustainable firewood use, pesticide use and tree planting (Brooks, 2010). Education, similarly, has been studied in relation to pro-environmental behavior, and many studies find a strong positive relationship (Abdul-Wahab & Abdo, 2010; Brooks, 2010; Woodrum & Wolkomir, 1997).

In addition to the evidence that pro-environmental behavior differs based on gender, income, and education, there is evidence that the Value-Belief-Norm Theory is useful in explaining pro-environmental behavior. The Value-Belief-Norm Theory was compared to the Theory of Planned Behavior, another behavior change theory that has been used to understand environmentalism, in a study by Aguilar-Luzón and colleagues (2012). This revealed that the Value-Belief-Norm Theory was the best model for predicting recycling behavior in Spanish housewives and may indicate that the Value-Belief-Norm Theory will be useful in explaining the expression of environmentalism, pro-environmental behavior. Other studies have also demonstrated the usefulness of the Value-Belief-Norm Theory in understanding pro-



environmental behaviors (Ibtissem, 2010; Jansson, Marell, & Nordlund, 2011; Menzel & Bögeholz, 2010).

### **Environmental Activism**

Environmental activism has less straightforward ties with gender, income, and education. O'Shaughnessy & Kennedy (2010) explain that although it appears that women engage in less environmental action than males, women engage in a unique type of environmental action termed *relational activism* which differs from more public-oriented and traditional activism typically used in studies to measure activism. For example, women engaged in relational activism may talk about sustainable practices at home with neighbors. Research by Mohai (1985) revealed that although income is correlated with activism, environmental activism displayed by the middle and upper classes was the result of access to resources and perceived self-efficacy. For example, the lack of education on sustainable behaviors may make an individual feel less confident in their ability to engage in such behaviors. Education seems to be related to activism. Woodrum and Wolkomir (1997) found that individuals with more education were more likely to engage in political behaviors such as signing a petition and participating in a demonstration.

### **Desired Government Role in Protecting the Environment**

After a careful literature search, there appears to be no published research studies on the desired government role in protecting the environment in relation to demographic factors of gender, income and education. However, non-demographic related research has been published. Research on the perception of government style and motivation for pro-environmental behavior revealed that an individual's perception of their government as supporting their autonomy positively influenced their environmental motivation (Lavergne, Sharp, Pelletier, & Holtby, 2010). For example, if an individual felt that their government was not supportive of their right

to make their own choices with regard to sustainable behaviors, they would experience less motivation to engage in environmentalism. A different study about improving environmental education found that most students wanted an increase in governmental intervention in protecting the environment, such as more rules and regulations (Jurin & Fox-Parrish, 2008).

### **The Current Study**

Does environmental expression differ by gender, income, and education? Although many studies have revealed that demographic factors are related to environmentalism, few studies conducted in the United States have linked demographic factors with specific types of environmental expression. Useful knowledge could be gained by knowing which type of environmental expression is the most strongly associated with each demographic factor. The present study will build on the findings of past research to analyze the relationship between demographic factors and expressions of environmentalism.

Due to a lack of peer-reviewed research studies, the relationships between gender and activism and all demographic factors related to government role will be exploratory in nature.

Significant results may suggest that capabilities and constraints should be studied for these factors as proposed by the Value-Belief-Norm Theory. If relationships are drawn between specific demographic groups and environmental expression, results can be used to target potential constraints influencing environmentalism.

## **Chapter II: Methodology**

### **Data Collection Procedures**

The data used for this study is from the General Social Surveys (GSS) conducted by NORC, a social science research center at the University of Chicago. The center has collected data from 1972-2010, using face-to-face interviews in Spanish and English with Computer-Assisted Personal Interview Technologies. When face-to-face interviews were not possible, telephone interviews were conducted instead. Interviews lasted an average of one and a half hours. The GSS data used for this current study is from the cross-sectional data set in 2010 released February 2, 2012.

### **Subject Selection and Description**

The sample for this study includes all 2,044 individuals from the 2010 sample. This includes both English and Spanish speaking individuals. Only individuals over the age of 18 living in the U.S. in non-institutional settings were selected for the survey. The sample is evenly distributed for gender (1,153 women and 891 men), but is predominantly made up of lower income individuals (1,894 low income and 150 medium to high income) with no college education (1,761 with no college and 278 with some college). Full probability sampling was used and the interviews were conducted in the first six months of 2010.

### **Instrumentation**

To measure environmentalism, six different variables were used that represent a different expression of this construct. The variables include: concern for environmental issues, willingness to pay money to protect the environment, pro-environmental behaviors (i.e., recycling), activism, (i.e., protesting/demonstrating), and desired government role in protecting the environment. Demographic variables that will be measured include gender, income, and education.

The variable, concern for environmental issues, was measured based on responses to the question “Generally speaking, how concerned are you about environmental issues? Please tell me what you think, where 1 means you are not at all concerned and 5 means you are very concerned.” Respondents were also given the choice to select 6, *can't choose*.

The variable, willingness to pay money to protect the environment, was measured based on responses to the question “How willing would you be to pay much higher prices in order to protect the environment?” Likert scale responses included 1 *agree strongly*, 2 *agree*, 3 *neither agree or disagree*, 4 *disagree*, 5 *disagree strongly*, or 6 *cant' choose*.

The variable, pro-environmental behavior, was measured based on responses to the question “How often do you make a special effort to sort glass or cans or plastic or newspapers and so on for recycling?” Likert scale responses included 1 *always*, 2 *often*, 3 *sometimes*, 4 *never*, or 5 *recycling not available where I live*.

The variable, activism, was measured based on responses to the question “In the last five years, have you taken part in a protest or demonstration about an environmental issue?” Response options included 1 *yes I have*, 2 *no I have not*, 8 *don't know*, or 9 *refused*.

The variable, desired government role in protecting the environment, was measured based on responses to the question “Some countries are doing more to protect the world environment than other countries are. In general, do you think that America is doing...” Responses options included 1 *more than enough*, 2 *about the right amount*, 3 *too little*, 0 *can't choose*, 8 *don't know*, or 9 *refused*.

Demographic variables were measured as following:

- Gender- the interviewer selected if the respondent was male or female with male coded 1 and female coded 2.

- Income- respondents were asked “Compared with American families in general, would you say your family income is—1 *far below average*, 2 *below average*, 3 *average*, 4 *above average*, or 5 *far above average*?” Options also included 8 *don't know* and 9 *refused*.
- Education- respondents were asked to indicate the highest level of education they completed. Responses range from 0 to 20 completed years of education.

### **Analyses**

A MANOVA was used to determine if the demographic variables, gender, income, and education, have significant effects on the expressions of environmentalism: concern, willingness to pay money to protect the environment and desired government role. These expressions are moderately correlated, so they were analyzed in one MANOVA. Two individual ANOVAs were used on the demographic factors and the expressions of environmentalism that are not correlated: pro-environmental behaviors and activism. The MANOVA and ANOVA analyses were also used to determine if there are significant interactions among the demographic variables and between the expressions of environmentalism. The demographic variables were categorized: gender (male or female), income (average-above average or below average), and education (12 years and below or above 12 years of completed education). Income and education were categorized in this way, instead of as continuous variables, to make a comparison of high income versus low income and college education compared to no college education.

### **Limitations**

One limitation of this study is that using existing data from the GSS limits the ability to analyze different aspects of environmental expression. Another limitation is that these analyses

limit the ability to make cause and effect conclusions, so the analysis is limited to determining group differences between types of environmental expression and demographic characteristics.

### Chapter III: Results

To determine if the demographic factors gender, income and education were related to the expressions of environmentalism, a MANOVA and two ANOVAs were conducted. To control for familywise error, a MANOVA was conducted on the demographic factors and three moderately correlated expressions of environmentalism: concern, willingness to pay money to protect the environment, and desired government role. Two individual ANOVAs were conducted on the demographic factors and two expressions of environmentalism because they were not correlated: pro-environmental behaviors and activism. Means and standard deviations are shown in Table 1.

#### Item Analysis

Table 1

##### *Frequencies of Demographic Factors*

Variable	Frequency (N=2,044)	Percentage
Gender		
Females	1,153	56.4%
Males	891	43.6%
Income		
Low	1,894	92.7%
Medium-High	150	7.3%
Education		
No college	1,761	86.2%
Some college	278	13.6%

Table 2

##### *Means and Standard Deviations of Expressions*

Variable	M	SD
Concern	3.86	1.11
Willingness to pay money	2.92	1.22
Pro-environmental behavior	2.15	1.14
Environmental Activism	1.98	0.15
Desired government role	2.44	0.67

### Sample Characteristics

#### Testing MANOVA Assumptions

Box's test was non-significant; the assumption of multivariate homogeneity was met.

Levene's test of equality of variances was significant for each dependent variable indicating that the assumption of homogeneity of variance was not met. This may impact confidence in the reliability of the univariate tests and the assumption that the multivariate test statistics are robust.

#### Differences in Concern, Willingness to Pay Money to Protect the Environment and Desired Government Role as a Function of Demographic Factors

Pillai's Trace was used for interpretation as it had the same results as Wilks' Lambda, Hotelling's Trace and Roy's Largest Root. Using Pillai's trace for multivariate tests, there was no effect of gender on concern, willingness to pay money to protect the environment, and desired government role,  $F(3,1237) = 0.27, p > .05$ . There was also no effect of income on concern, willingness to pay money to protect the environment, and desired government role,  $F(3,1237) = 1.34, p > .05$ . However, there was a significant effect of education on concern, willingness to pay money to protect the environment, and desired government role,  $F(3,1237) = 2.92, p < .05$ .

Separate univariate ANOVAs revealed that, compared to respondents with no college education, those with some college education expressed more concern for the environment,



$F(1,1235) = 4.77, p > .05$ ., are less willing to pay higher prices to protect the environment,  $F(1,1235) = 5.24, p > .05$ , and express a greater desire for the government to do more to protect the environment,  $F(1,1235) = 4.68, p > .05$  compared to those with no college education.

The interaction between education and income approached significance for concern for the environment and willingness to pay higher prices to protect the environment. Those with some college education and higher income expressed more concern for the environment,  $F(1,1235) = 2.21, p = 0.14$ , compared to those with no college education and lower income. Those with no college education and higher income expressed greater willingness to pay higher prices to protect the environment,  $F(1,1235) = 2.17, p = 0.14$ , compared to those with some college education and lower income.

### **Differences in Pro-environmental Behaviors and Activism as a Function of Demographic Factors**

Results of separate ANOVAs revealed no effects of gender on pro-environmental behaviors,  $F(1,1237) = 0.23, p > .05$ , and activism,  $F(1,1237) = 0.41, p > .05$ . Similarly, income was not related to pro-environmental behaviors,  $F(1,1237) = 0.85, p > .05$ , or activism,  $F(1,1237) = 0.44, p > .05$ . However, education was found to be related to pro-environmental behaviors; individuals with no college education were more likely to engage in pro-environmental behaviors than those with some college education,  $F(1,1237) = 10.21, p < .05$ . There was no association between education, or activism,  $F(1,1237) = 0.54, p > .05$ .

## Chapter IV: Discussion

As previously discussed, the demographic factors gender, income and education should influence an individual's capabilities and constraints, thereby impacting the type of environmental action an individual will take. Education was positively related to concern for the environment and desired government role to protect the environment. Individuals with some college education expressed more concern than individuals with no college education. This parallels the research of citizens in Oman who with more education had greater knowledge about the environment and expressed more concern than less educated citizens (Abdul-Wahab & Abdo, 2010). Statistical analyses revealed that the demographic factors gender and income were not related to any of the expressions. However, the interaction between income and education approached significance for the concern for the environment expression. Individuals with higher income and some college education expressed more concern for the environment than individuals with no college education and lower income. This is consistent with Mohai's argument that individuals in the lower class are just as concerned about the environment but are constrained by fewer resources and lower self-efficacy (1985).

Gender and income were similarly not related to willingness to pay money to protect the environment, but the interaction between income and education approached significance. Surprisingly, individuals with higher income and no college education expressed more willingness to pay money to protect the environment. The income finding is consistent with studies that demonstrate a positive relationship between income and willingness to pay money to protect the environment (Ezebilo et al., 2010; Halkos & Matsiori, 2012). However, the education finding conflicts with other studies that revealed a positive relationship between education and willingness to pay money to protect the environment (Engel & Potschke, 1998; Ezebilo et al.,

2010). In contrast, results of this study indicate that individuals with some college education were less willing to pay money to protect the environment than individuals with no college education. This conflicting outcome may be due to an unequal sample for the education demographic since the majority of participants indicated they had no college education.

Gender and income were not related to pro-environmental behavior but education was related. Interestingly, individuals with no college education were more likely to engage in pro-environmental behaviors. This is inconsistent with many studies that find a strong positive relationship between education and pro-environmental behaviors (Abdul-Wahab & Abdo, 2010; Brooks, 2010; Woodrum & Wolkomir, 1997). Once again, this may be due to the unequal sample size between education levels.

Similarly, gender, income and education were not related to activism. This differs from Woodrum and Wolkomir's (1997) findings that individuals with more education were more likely to engage in the following political behaviors: signing a petition, giving money to an environmental group, joining an environmental group, and participating in a demonstration.

Gender and income were not related to desired government role but education is. Individuals with some college education expressed a greater desire for the government to do more to protect the environment. There has been little research on desired government role and demographic factors so this finding is new information to consider in understanding environmentalism.

The relationship between education and the expressions of environmental concern for the environment and desired increased government role in protecting the environment, along with the interaction between income and education for environmental concern support the hypothesis that capabilities and constraints may play a role in environmentalism as proposed by the Value-Belief Norm theory. Education may function as a capability influencing concern for the

environment and desire for the government to play a larger role. Similarly, the interaction between income and education may be functioning as a capability to influence the expression of concern for the environment. However, the unexpected relationship between education and the expressions of environmentalism willingness to pay money to protect the environment and pro-environmental behavior suggest that more is involved than capabilities and constraints. Perhaps values, beliefs or personal norms to take action may be involved in this complex relationship.

### **Limitations**

There are limitations to this study that must also be considered when understanding the results. There is a disparity in the sample population in terms of both demographic categories of education and income levels. The majority of the individuals who participated in the study indicated they were below average in income or far below average in income and had no college education. Since the sample was dichotomized into low income compared to high income and no college education compared to some college education, unequal sample sizes and variances may account for the unexpected results.

### **Implications**

These findings have some theoretical implications as education is clearly related to environmentalism. Education may act as a capability or constraint for the expressions concern for the environment and desire for the government to play a larger role in protecting the environment. However, for the expressions willingness to pay to protect the environment and pro-environmental behavior, it appears that education may be a more complicated relationship than simply a capability or constraint. Values, beliefs and personal norms to take action may help explain how education may or may not act as a capability or constraint.

These findings have practical implications. Initiatives designed to increase willingness to pay money to protect the environment or pro-environmental behaviors should take education into consideration. If researchers know why more highly educated individuals are less willing to pay money to protect the environment or less likely to engage in pro-environmental behaviors, this could be targeted in intervention.

### **Conclusions**

Results from this research study demonstrate that it should not be assumed that some demographic groups are less concerned about the environment than other groups. Rather, capabilities may be influencing the way environmentalism is expressed. These capabilities and constraints should be targeted for specific groups when attempting to understand or influence environmentalism. For example, this study is the first to demonstrate the relationship between level of education and desire for the government to play a larger role in protecting the environment. However, research on actual behavior as it relates to this expression would be useful, for example, a study on education and voting behavior. Research on additional demographic factors, particularly ethnicity and expressions of environmentalism would also be highly beneficial.

### **Recommendations**

Future studies should examine the capabilities and constraints related to the negative relationship that was revealed between level of education and the expressions willingness to pay and pro-environmental behavior. More research should also be conducted using a sample with a more even distribution of income and level of education. This will shed light on whether a genuine positive relationship exists between education and the expressions concern for the environment and desired government role.

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