Factors Affecting Pro-Environmental Attitudes

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ABSTRACT

Using data from the fifth wave of the World Values Survey (2005-2008), this study examined the relationship between affluence, post-materialist values, and pro-environmental attitudes from individuals from Morocco, Uruguay, Sweden, and the United States. Demographic variables were also analyzed to determine which factors were the best predictors of pro-environmental attitudes from each of the four countries. A three step regression procedure was used to test the Post-Materialist Value Theory: (A) if an individual's affluence is a significant predictor of their pro-environmental attitudes, (B) if post-materialist values are significant predictors of their pro-environmental attitudes, and (C) whether or not affluence continues to be a significant predictor of their pro-environmental attitudes when simultaneously regressed with post-materialist values. Results demonstrate that affluence is not always a significant predictor of pro-environmental attitudes, and the relationship between affluence and pro-environmental attitudes was not mediated by post-materialist values for individuals from any of the four countries. Also, none of the demographic variables were found to be consistently significant for all four country samples. Therefore, the findings of this study suggest that environmentalism cannot be completely explained by a cultural value shift from materialist to post-materialist, and it appears that pro-environmental attitudes emerge from multiple facets that vary by the society under examination.

INTRODUCTION

Environmental degradation and the depletion of natural resources are on the rise at an alarming rate (International Fund for Agricultural Development 2007). With the world population estimated to reach nearly nine billion by 2050 (Weeks 2005), it is imperative that effective measures to shift towards a more sustainable way of life for all human beings is adopted (United Nations Environment Programme 2007). As more nations are quantifying the degree of their environmental problems, values and attitudes towards the environment are drastically shifting. Typically, the initial response to these problems has been a push for economic development, but just as Engel and Pötschke (1998) note "…environmental problems will not be solved merely through technical progress and environmentally compatible products. Changes on the individual level, in the attitudes and the behavior of people are also needed" (315). In order to make these changes, the connection between what prompts support for the environment and the construction of environmental attitudes must be examined.

With the growth of environmentalism in the 1960's and 1970's, the idea that only wealthy, developed nations held much concern for environmental issues was widely accepted (Brechin and Kempton 1994; Brechin 1999; Kemmelmeier, Krol, and Kim 2002; Gelissen 2007; Dunlap and York 2008; Duroy 2008). This conventional wisdom became known as the Post-Materialist Value Theory, or the 'affluent hypothesis'. The 1980's ushered in multiple cross-national surveys on individual's attitudes and values which acted as the basis for challenging this conventional wisdom (Gelissen 2007). With the ability to make cross-national comparisons, economic wealth and the presence of post-materialist values did not appear to be critical antecedents of environmentalism everywhere (Brechin 1999). This has led many environmental sociologists to argue that environmentalism is a shared global phenomenon which is triggered by varying factors, rather than simply the result of value changes or affluence (Gelissen 2007).

Examining the Post-Materialist Theory adds to previous research, which has found mixed results pertaining to its validity. This research identifies the significant factors which influence individual level environmentalism for four different nations. These factors are important for political figures and social policy makers to consider in their matters towards the environment. In an effort to lay conventional wisdom concerning environmentalism to rest, this study presents evidence that environmentalism is not limited only to wealthy, developed nations.

LITERATURE REVIEW

Post-Materialist Value Theory

In the 1960's, as western industrial societies began to see increases in their total wealth, they also began to see a shift in their basic set of values shared: a shift from materialist to post-materialist values (Brechin and Kempton 1994; Gelissen 2007). Materialist values encompass concerns about economic and physical security, while post-materialist values include concerns regarding one's quality of life, freedom, and the environment (Gelissen 2007). In an effort to explain this shift, Ronald Ingelhart developed the Post-Materialist Value Theory: poorer nations and their individuals must focus on meeting their "material" needs before they are able to concentrate on their post-materialist needs and concerns, such as environmental problems (Dunlap and York 2008). Many view this theory in relation to Maslow's Hierarchy of Needs[1]. Therefore, the wealthier the country, the more post-materialist values they hold, and the more pro-environmental they should be.

In recent years, this 'affluent hypothesis' has been met with opposition as developing countries have also been shown to hold pro-environmental values and attitudes (Brechin and Kempton 1994; Brechin 1999; Dunlap and Mertig 1997; Gelissen 2007; Marqaurt-Pyatt 2007; Dunlap and York 2008). In 1995, Ingelhart examined data from the World Values Survey (WVS); these results showed only a small, weak relationship present between a nation's affluence and their environmental concern (Dunlap and York 2008). He responded to these differences by generating an ad hoc explanation coined the "objective problems-subjective values" (OPSV) explanation (Brechin 1999; Gelissen 2007; Dunlap and York 2008).

The OPSV states that environmentalism found in developed nations (what Ingelhart refers to as nations of the North) is due to citizens experiencing a shift in their subjective (cultural) values. Whereas, environmentalism present in less developed nations (the South) is said to be the result of citizens being subjected to higher levels of pollution and environmental degradation, or objective problems (Dunlap and York 2008). Ingelhart has continued to back his theory of post-materialist values by offering slight moderations, such as the OPSV, in an attempt to explain the rising level of environmental concern and activism found in less developed nations.

To date, researchers have come to varying conclusions pertaining to the validity of the Post-Materialist Value Theory. One reason these discrepancies may exist can be attributed to the use of different measurements to gauge environmental attitudes and concerns (Klineberg, McKeever, and Rothenbach 1998; Kemmelmeier et al. 2002; Gelissen 2007; Marquart-Pyatt 2007; Duroy 2008). The four commonly used measures of environmentalism are (1) environmental concern (as measured by economy/government trade-offs), (2) perceived seriousness of local and world environmental problems, (3) pro-environmental behaviors, and (4) one's perceived relationship between human activities and nature.

Economic Factors

Kemmelmeier et al. (2002) examined the importance of economic factors in relation to the validity of the Post-Materialist Values Theory by attitudes toward the environment. At the societal level, a nation's material wealth was measured by their GDP per capita, while at the individual level, an individual's total sum of monthly earnings determined their affluence. Environmental concern was measured by respondent's answer to multiple questions pertaining to their willingness to pay for the environment. The results of Kemmelmeier et al. (2002) study suggested that economic factors are able to predict environmental attitudes at the societal level, but not at the individual level. Also, the results showed that the relationship between affluence and environmental attitudes was not mediated by post-materialist values at either level of measurement. The authors conclude that economic factors do play an important role in the formation of some pro-environmental attitudes and behaviors, but not all. Also, many pro-environmental attitudes and behaviors are "not necessarily linked to or even the product of economic prosperity" (280).

Further investigation into the Post-Materialist Value Theory by Dunlap and York (2008) examined data from three waves of the WVS, as well as the Health of the Planet Survey (HOP)[2]. Just as Kemmelmeier et al. (2002) utilized, environmental concern was measured by respondent's answers to multiple questions concerning their willingness to pay for the environment. They also included measures of respondent's perceived seriousness of

[1] Maslow's theory states that higher-order needs (such as environmentalism) are extremely fulfilling, but cannot be met until lower-order needs have been met (such as acquiring enough food).

[2] The HOP survey (1992) collected information on 24 diverse economic and geographical nations regarding their concern for certain environmental problems and support for increased environmental protection. This was one of the first major studies to produce strong evidence against the post-materialist value theory, as environmental concern was not found to be limited to wealthy nations, and in some cases, appeared to be stronger among some poorer nations (Dunlap and York 2008).

environmental problems and their environmental behaviors; scores were aggregated to allow for societal level analysis. Each nation's GDP per capita and Log GDP per capita[3] were used to determine their affluence.

For the post-materialist theory to hold true, significant positive correlations would need to be consistently present between affluence and the environmental measures. However, Dunlap and York (2008) produced varying results: three significant negative results indicating a higher level of environmental concern present in less developed nations, and three significant positive correlations indicating a higher level of environmental concern in more developed nations. Dunlap and York (2008) point to the fact that the positive correlations dealt with questions relating to "economic trade-offs, and are thus biased in favor of residents of wealthier nations who clearly have a greater 'ability to pay' than do their counterparts in poorer nations" (534).

Brechin and Kempton (1994) came to similar conclusions to those of Dunlap and York (2008) and Kemmelmeir et al. (2002) by examining data from the Harris (1989) and Gallup surveys. These surveys included questions concerning an individual's willingness to pay for the environment (economic trade-offs) and various environmental concerns. Of the 13 environmental indicators analyzed, five yielded significant results, with three of the relationships indicating greater environmental concern in poorer, developing nations. The two other significant relationships indicated greater environmental concern in wealthier, developed nations, but both of these dealt with economic trade-offs.

Noting the same concerns as Dunlap and York (2008) regarding these questions, Brechin and Kempton (1994) also analyzed a question from the Harris survey which asked about respondent's willingness to volunteer their time for the environment. Interestingly, the results from this question "suggest that citizens of some developing countries are less likely to agree to pay more money, but they are equally or more likely to agree to commit their labor time" (Brechin and Kempton 1994:259). Brechin and Kempton (1994) concluded that their analyses did not support the Post-Materialist Value Theory; they consider environmentalism to be a global phenomenon not limited to wealthy, industrialized nations.

Demographic Effects

Many variables have revealed higher levels of association between environmental attitudes, values, and behaviors compared to a country's affluence. "The most consistent findings are that environmental supporters tend to be younger, better educated, and politically moderate or liberal, although even these relationships have occasionally been contradicted by other studies" (Klineberg et al. 1998:735). Klineberg et al. (1998) used the demographic variables of age, education, gender, ethnicity, household income, political ideology, and religiousness to view their relationship to the four common measures of environmentalism. Age and education were the only two variables which yielded consistent significant results along all four measures of environmentalism, with age correlating negatively and education correlating positively.

Political ideology (moderate or liberal) was consistently significant in relation to environmental concerns (economy/government trade-offs), while household income was consistently significant in relation to pro-environmental behaviors. Ethnicity, religiousness and gender produced varying results for all measures of environmentalism, and the authors suggest further examination of these variables by the relating significant measurements. Engel and Pötschke (1998) utilized different willingness to pay questions, but also found there to be positive correlations with an individual's education and income as Klineberg et al. (1998) did. In addition, Engel and Pötschke (1998) found weak and inconsistent results pertaining to gender. Just as Klineberg et al. (1998) suggested, further examination of this variable in its relation to pro-environmental attitudes and behaviors is needed.

Hypotheses

The direct and indirect effects hypotheses used by Kemmelmeier et al. (2002) were utilized to examine the relationships between environmental attitudes, affluence, and post-materialist values. The direct effects hypothesis predicts a positive significant relationship between an individual's affluence and their pro-environmental attitudes: the higher an individual's affluence, the more pro-environmental they should be. The indirect effects hypothesis also predicts a positive significant relationship between post-materialist values and pro-environmental attitudes. In addition, when affluence and post-materialist values are simultaneously analyzed, affluence must no longer be a significant predictor of pro-environmental attitudes. This indicates that the relationship between affluence and pro-environmental attitudes is mediated by post-materialist values.

[3] Inclusion of country's GDP per capita and log GDP per capita were used to determine if the relationship between affluence and pro-environmental attitudes was linear or logistic. The Post-materialist Value Theory predicts a positive linear relationship, but as Dunlap and York (2008) note, the OPSV variation of the theory would predict a rapid increase in pro-environmental attitudes and concerns after a nation has reached a certain level of affluence.

Individuals' age and educational level attained have produced the most consistent relationships concerning their environmental attitudes (Klineberg et al. 1998; Gelissen 2007). If the research hypotheses are supported, younger individuals, as well as those with higher levels of education attained, are more likely to be pro-environmental (Engel and Pötschke 1998; Klineberg et al. 1998; Gelissen 2007; Marquart-Pyatt 2007). Although met with inconclusive results, studies have identified significant relationships between individuals' sex, political orientation, and religiosity with their environmental attitudes. If the research hypothesis is supported, it would suggest that females are more likely to be pro-environmental than males (Klineberg et al. 1998; Gelissen 2007). Also, if the research hypotheses are supported, they would suggest that liberals and nonreligious individuals are more pro-environmental than conservatives and religious individuals.

DATA AND METHODS

Unit of Analysis

The unit of analysis for this study is individual attitudes towards the environment. These attitudes are a compilation of three questions aimed at determining whether respondents are willing to pay for environmental protection.

Sample

This study examined data from the fifth wave of the World Values Survey (WVS) which was collected over a three year period (2005-2008). The fifth wave data file is composed of representative survey data from 77,000 respondents from 54 different countries. The present study examined individuals from Morocco, Uruguay, Sweden, and the United States. These four countries were chosen based on their economic classifications from the 2009 World Bank list of economies and their positioning on the Ingelhart-Welzel Cultural Map of the World.

The use of random probability sampling was utilized in each country when possible, or a closely related sampling method. Each survey was translated accordingly to the appropriate language of the country in which it was administered (World Values Survey, 2009). All of the data collected from the questionnaires was reviewed by the WVS Executive Committee who ran internal consistency checks between the type of sampling methods implemented and the results from each country. This ensures that good sample generalizability was secured within the data.

Measures

The dependent variable of this study is pro-environmental attitudes measured by the index support for the environment. The index is comprised of responses to three questions asking respondents if they were willing to incur costs to prevent environmental pollution. Values ranged from 3 to 12, with higher scores indicating more pro-environmental attitudes. The first two questions (give income and increase taxes to prevent pollution) were recoded so that higher numbered responses indicated more pro-environmental attitudes, similar to the third question in the index (reduce pollution without incurring costs).

An individual's affluence was measured by their subjective placement on their country's income scale with responses ranging from (1) Lower step to (10) Upper step. One of the main independent variables, materialist, mixed or post-materialist value orientation, was measured using indexed responses to two questions. Respondents determined what they believed to be the first and second most important issues out of four choices: (1) Maintaining order in the nation; (2) Give people more say; (3) Fighting rising prices; or (4) Protecting freedom of speech. Individuals said to hold materialist values have a combination of answers (1) and (3), while individuals said to hold post-materialist values have a combination of answers (2) and (4). Individuals holding a mixture of materialist and post-materialist values have a combination of answers (1) and (2) or a combination of answers (3) and (4). For analytical purposes, the post-materialist variable was dichotomized into two dummy variables with individuals holding post-materialist values being the reference group.

Demographic data was also collected in the survey, where respondents' sex was recorded by the interviewer's observation, and their age was obtained through an open-ended question. Educational level was measured by the use of an ordinal variable ranging from (1) No formal education to (9) University level education, with degree. Religiousness was measured by choosing whether respondents considered themselves to be (1) A religious person, (2) Not a religious person, or (3) A convinced atheist. This variable was also dichotomized so that the relationship could be viewed between individuals who identified themselves as religious and those who are not ('not a religious person' and a 'convinced atheist'). Refer to Table 1 for a complete list of variable labels, questions, and measures.

Table 1. Definitions of Variables

Support for Environment Index (Y003)
This variable is an index of 2 statements:
a) (V105) "I would give part of my income if I were certain that the money would be used to prevent environmental pollution."
b) (V106) "I would agree to an increase in taxes if the extra money were used to prevent environmental pollution."
c) (V107) "The Government should reduce environmental pollution, but it should not cost me any money."
Responses for V105 and V106 were recoded to 1=Strongly disagree; 2=Disagree; 3=Agree; 4=Strongly agree. V107 responses were 1= strongly agree; 2=Agree; 3=Disagree; 4=Strongly disagree. Index responses range from 3=Low support for environmental protection to 12=High support for environmental protection.

Post-Materialist Index (Y002)
This variable is an index of 2 questions:
a) (V71) "If you had to choose, which one of the things on this card would you say is most important?" (Code one answer only under "first choice"):
b) (V72) "And which would be the next most important?" (Code one answer only under "second choice"):
Index responses range from 1('Materialist'): (1) Maintaining order in the nation; (3) Fighting rising prices, 2('Mixed'): 2)Giving people more say in important government decisions & (1)Maintaining order in the nation OR (3) Fighting rising prices & (4)Protecting freedom of speech, to 3('Postmaterialist'): (2)Giving people more say in important government decisions; (4)Protecting freedom of speech.

Scale of Incomes (V253)
"On a scale of incomes on which 1 indicates the "lowest income decile" and 10 the "highest income decile" in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in." (Code one number):
Responses range from 1=Lowest decile to 10=Highest decile

Self Positioning on Political Scale (V114)
"In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking?"
Responses range from 1 through 10. 1=Left (Liberal) through 10=Right (Conservative).

Religious Person (V187)
"Independently of whether you attend religious services or not, would you say you are" (read out and code one answer): 1=A religious person; 2=Not a religious person; 3=An atheist.

Sex of Respondent (V235)
Sex (Code respondent's sex by observation): 1=Male; 2=Female

Age (V237)
Respondent's Age in Years

Highest Educational Level Attained (V238)
"What is the highest educational level that you have attained?" [NOTE: if respondent indicates to be a student, code highest level s/he expects to complete]:
1=No formal education; 2=Incomplete primary school; 3=Complete primary school; 4=Incomplete secondary school: technical/vocational type; 5=Complete secondary school: technical/vocational type; 6=Incomplete secondary: university-preparatory type; 7=Complete secondary: university-preparatory type; 8=Some university-level education, without degree; 9=University-level education, with degree.

Country (V2)
11= United States; 19=Sweden; 54= Uruguay; 90= Morocco

Source: 2005-2008 World Values Survey

RESULTS

Univariate Statistics

Dependent Variables. In the present study, the dependent variable, pro-environmental attitudes, was measured by an index comprised of three questions. The index produced an acceptable Cronbach's alpha for the samples from the United States (α=.662) and Sweden (α=.764), but less acceptable alphas for the samples from Morocco (α=.595) and Uruguay (α=.544).

From Table 2 showing the descriptive statistics of the variables, we can see that this index is relatively even in distribution by all four countries' individuals. The individuals from Morocco hold a slightly lower mean value indicating less support for the environment in terms of incurring costs to prevent or reduce pollution, while Sweden and the United States hold slightly higher mean values indicating more support for the environment. Just as Dunlap and York (2008) cautioned, these differences could be explained by the fact that this variable is comprised of questions regarding economic trade-offs which could be biased towards advanced industrial societies. Although this possibility exists, the descriptive statistics lend support to the Post-Materialist Value Theory, which predicts that wealthier nations will hold more pro-environmental values.

Table 2. Descriptive Characteristics of Individuals from Morocco, Uruguay, Sweden, and the United States

	Valid %/Mean			
Characteristic	**Morocco**	**Uruguay**	**Sweden**	**U.S.**
N				
Support for Environment Index	**1132**	**887**	**975**	**1205**
(3 thru 12 with higher value= more support)	5.92	6.46	8.31	7.09
Post-Materialist Index	**1200**	**899**	**986**	**1222**
Materialist	51.60%	17.60%	5.10%	20.90%
Mixed	42.00%	56.60%	69.50%	60.70%
Post-materialist	6.50%	25.80%	25.50%	18.40%
Scale of Incomes	**1195**	**975**	**952**	**1153**
(Higher value= higher income)	4.66	4.44	6.07	5.04
Self Positioning on Political Scale	**507**	**867**	**975**	**1203**
(Higher value= more conservative)	5.72	5.23	5.59	5.71
Religious Person	**1172**	**997**	**981**	**1202**
A religious person	91.80%	56.40%	33.20%	74.50%
Not a religious person	8.20%	36.00%	49.40%	22.50%
A convinced atheist		7.60%	17.30%	2.90%
Sex	**1200**	**1000**	**1003**	**1249**
Male	49.30%	44.40%	50.10%	50.00%
Female	50.70%	55.60%	49.90%	50.00%
Age	**1198**	**1000**	**1003**	**1249**
	37.10	46.53	47.73	47.96
Highest Educational Level Attained	**1200**	**998**	**996**	**1249**
No formal education	58.40%	1.70%		
Incomplete primary school	8.80%	13.60%	1.80%	
Complete primary school	5.80%	23.90%	11.80%	3.80%
Incomplete secondary school: tech/vocational	2.80%	31.60%	1.60%	11.40%
Complete secondary school: tech/vocational	3.50%	13.90%	4.10%	33.30%
Incomplete secondary school: university/prep	4.00%	0.10%	16.90%	19.50%
Complete secondary school: university/prep	12.30%	0.30%	14.80%	21.80%
Some university education, w/o degree	1.00%	7.00%	14.90%	8.20%
University education, w/ degree	3.50%	7.80%	34.10%	2.00%

Source: 2005-2008 World Values Survey

Independent Variables. Table 2 also presents the descriptive statistics of the independent variables. Regarding one of the main independent variables, (post-materialist, mixed, or materialist value orientation), the majority of respondents from the United States, Sweden, and Uruguay fall under the category 'mixed', meaning they share both materialist and post-materialist values. The majority of respondents from Morocco were found to hold materialist values. This coincides with the Post-Materialist Value Theory, which states that the more developed, advanced societies hold a larger number of post-materialists. On the other hand, evidence against this theory is produced in the table as Uruguay (an upper middle income nation), holds a significantly greater percentage of post-materialists relative to the United States (a high income nation), and a slightly higher percentage of post-materialists relative to Sweden (also a high income nation).

Another independent variable, affluence, or one's economic position, was determined by the individual's subjective placement on their country's income scale. A majority of individuals from all four countries positioned themselves somewhere in the middle of their country's income scales. Therefore, this variable had a relatively normal distribution for all for samples. Political orientation was also relatively even in distribution for all four countries, as most individuals tend to consider themselves as politically moderate. A slightly higher percentage of individuals from the United States considered themselves to be "Right", while a slightly higher percentage of individuals from Uruguay considered themselves to be more "Left".

Assessment of respondents' religiousness found that a significantly higher percentage of individuals from the United States and Morocco consider themselves to be religious. The sex of the respondents was split almost equally for participants for all four countries which generates a higher rate of generalizability for this study. The mean age of participants from the United States, Sweden, and Uruguay are all very close (late 40's), while participants from Morocco had a mean age nearly ten years younger. This indicates that a significant amount of the participants from Morocco are younger than those from the other three countries.

Individuals from the United States have a relatively normal distribution regarding the level of education they have attained, while individuals from Uruguay and Morocco have a distribution skewed to the right. This implies that a smaller amount of individuals from Uruguay and Morocco have received or completed any form of education. Individuals from Sweden on the other hand, have a distribution which is skewed to the left, with a high percentage of individuals indicating that they had a university education (with a degree). Due to the large variance between the levels of education obtained by individuals from each country, further analysis should help us explain to what extent education influences pro-environmental attitudes.

Bivariate Analysis

Bivariate correlation analysis was used to determine the relationship between the index support for the environment and the seven independent variables (Table 3). For individuals from the United States, six out of the seven independent variables were statistically correlated, with sex being the only insignificant variable. Three independent variables were shown to have statistical significance by the index support for the environment for individuals from Morocco (post-materialist index, scale of incomes, and highest educational level attained) and Sweden (post-materialist index, self positioning on political scale, and highest educational level attained). Only two independent variables yield significant relationships (scale of incomes and self positioning on political scale) for individuals from Uruguay. Sex was not found to be statistically significant for any of the four countries' individuals and will not be discussed further in this section, as well as any of the other insignificant correlations, which were found for each country's sample.

Table 3. Correlation Analyses

	Support for the Environment Index			
	Morocco	**Uruguay**	**Sweden**	**United States**
Post-Materialist Index				
Materialist(1) vs. Post-materialist(0)	0.028	-0.033	-0.026	-0.044
Mixed(1) vs. Post-materialist(0)	-.069*	0.012	-.170**	-.077**
Scale of Incomes				
Higher value = higher income	.109**	.095**	-0.027	.162**
Self Positioning on Political Scale				
Higher value = more conservative	0.070	.071*	-.238**	-.115**
Religious Person				
Nonreligious(1) vs. Religious(0)	-0.009	-0.010	-0.013	-.067*
Sex				
Female(1) vs. Male(0)	-0.004	-0.011	0.034	0.004
Age	-0.046	0.039	-0.027	.018**
Highest Educational Level Attained				
Higher value = higher level attained	.191**	0.012	.143**	.208**

Source: 2005-2008 World Values Survey
**=Significant at .01 level *=Significant at .05 level

Individuals from Morocco, Sweden, and the United States shared two similar significant correlations by the index support for the environment: the post-materialist index (dichotomized mixed values variable) and the variable highest educational level. The dichotomized mixed value variable yielded a negative relationship with the index support for the environment, which supports the research hypothesis; post-materialists are more likely to hold pro-environmental attitudes relative to individuals who hold mixed or materialist values. Also, the significant correlation with the education variable supports the hypothesis that individuals who have attained higher levels of education are more likely to hold pro-environmental attitudes. Educational level attained was the most significant variable for individuals from Morocco and the United States. This is an interesting finding considering nearly 60% of the respondents from Morocco indicated that they did not have any formal education (Table 2).

Lending support for the direct effects hypothesis, the variable scale of incomes was found to be significant at the .01 level for individuals from Morocco, Uruguay, and the United States. This positive correlation indicates that the higher individuals placed themselves on their country's income scale, the more likely they were to hold pro-environmental attitudes. The variable self positioning on political scale was found to be significantly correlated with the index support for the environment for individuals from Uruguay at the .05 level, and for individuals from Sweden and the United States at the .01 level. This variable produced a negative correlation for individuals from Sweden and the United States, which supports the research hypothesis that liberals are more likely to hold pro-environmental attitudes relative to conservatives. Evidence against this research hypothesis is found in the positive relationship for individuals from Uruguay; conservatives are more likely to hold pro-environmental attitudes relative to liberals, although this relationship is rather weak.

The variables religious person and age were found to be significantly correlated with the index support for the environment only for individuals from the United States. Both variables produced relationships opposite of what the research hypotheses had predicted, although both were rather weak. Nonreligious individuals are less likely to hold pro-environmental attitudes relative to religious individuals, while older individuals are more likely to hold pro-environmental attitudes relative to younger individuals.

Regression Analysis

Linear regression was used to assess the relationship between the independent variables and the dependent variable, (support for the environment). To test the direct effects hypothesis, which predicts a positive significant relationship between individual's pro-environmental attitudes and affluence, the index support for the environment was regressed on the variable scale of incomes. Previous research (e.g. Klineberg et al. 1998, Kemmelmeier et al. 2002, and Gelissen 2007) has found that an individual's age, sex, education, political orientation, and religiousness are related to their pro-environmental attitudes. In all four samples, sex was not found to be a significant predictor of pro-environmental attitudes and exclusion of this variable in the analyses did not change the amount of variance explained. Therefore, individual's age, education, political orientation, and religiousness were controlled for.

To test the indirect effects hypothesis, a three-step regression procedure used by Kemmelmeier et al. (2002) was utilized to determine if the relationship between pro-environmental attitudes and affluence is mediated by post-materialist values. The first step (A) is the same regression analysis used to test the direct effects hypothesis: regression of the index support for the environment on the variable scale of incomes. In the second step (B), the index support for the environment is predicted by the post-materialist index. In the third step (C), the index support for the environment is predicted by the scale of incomes and dichotomized post-materialist variables. The same control variables used to test the direct effects hypothesis are used to test the indirect effects hypothesis.

For the indirect effects hypothesis to be true, the dichotomized post-materialist variables need to yield negative significant relationships with the index support for the environment in the second (B) and third (C) steps, while the variable scale of incomes needs to yield a positive significant relationship by the index support for the environment in the first step (A), but not in the third step (C). Under these conditions, we are able to conclude that the relationship between an individual's pro-environmental attitudes and affluence is mediated by post-materialist values. Tables 4.1-4.4 show the results of these regression analyses for individuals from all four countries.

Table 4.1. Regression Analysis for Morocco

	Direct Effects Hypothesis (A)		Indirect Effects Hypothesis (B)		(C)	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
(Constant)	5.503**	0.460	5.906**	0.493	5.921**	0.544
Materialist+			-0.251	0.293	-0.252	0.294
Mixed+			-0.505	0.286	-0.504	0.286
Scale of Incomes (Higher value= higher income)	-0.007	0.056			-0.004	0.058
Self Positioning on Political Scale (Higher value= more conservative)	0.034	0.045	0.029	0.046	0.029	0.046
Religious Person Nonreligious(1) vs. Religious(0)	-0.296	0.293	-0.136	0.309	-0.135	0.310
Age	-0.003	0.007	-0.003	0.008	-0.003	0.008
Highest Educational Level Attained (Higher value= higher level attained)	.146**	0.033	.137**	0.032	.138**	0.034
Adjusted R^2		0.046		0.048		0.046

Source: 2005-2008 World Values Survey
* Regression is significant at .05 level **Regression is significant at .01 level +Reference group=Post-materialists

Table 4.2. Regression Analysis for Uruguay

	Direct Effects Hypothesis (A)		Indirect Effects Hypothesis (B)		(C)	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
(Constant)	6.245**	0.303	6.568**	0.331	6.200**	0.356
Materialist+			-0.168	0.208	-0.141	0.209
Mixed+			0.017	0.159	0.029	0.160
Scale of Incomes (Higher value= higher income)	.096*	0.038			.103*	0.040
Self Positioning on Political Scale (Higher value= more conservative)	-.061*	0.026	-.059*	0.028	-.061*	0.028
Religious Person Nonreligious(1) vs. Religious(0)	-0.120	0.124	-0.148	0.133	-0.143	0.134
Age	0.006	0.003	0.005	0.004	0.005	0.004
Highest Educational Level Attained (Higher value= higher level attained)	-0.017	0.033	0.012	0.034	-0.011	0.036
Adjusted R^2		0.011		0.004		0.010

Source: 2005-2008 World Values Survey
*Regression is significant at .05 level **Regression is significant at .01 level +Reference group=Post-materialists

Table 4.3. Regression Analysis for Sweden

	Direct Effects Hypothesis (A)		Indirect Effects Hypothesis (B)		(C)	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
(Constant)	8.247**	0.334	8.676**	0.341	8.651**	0.355
Materialist+			-.603*	0.262	-.627*	0.273
Mixed+			-.476**	0.131	-.466**	0.133
Scale of Incomes (Higher value= higher income)	-0.020	0.020			-0.021	0.020
Self Positioning on Political Scale (Higher value= more conservative)	-.198**	0.026	-.187**	0.026	-.177**	0.027
Religious Person Nonreligious(1) vs. Religious(0)	-0.144	0.119	-.199**	0.116	-0.191	0.119
Age	0.006	0.004	0.005	0.003	0.006	0.004
Highest Educational Level Attained (Higher value= higher level attained)	.160**	0.029	.142**	0.028	.146**	0.030
Adjusted R^2		0.081		0.103		0.096

Source: 2005-2008 World Values Survey
* Regression is significant at .05 level **Regression is significant at .01 level +Reference group= Post-materialists

Table 4.4. Regression Analysis for the United States

	Direct Effects Hypothesis (A)		Indirect Effects Hypothesis (B)		(C)	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
(Constant)	4.871**	0.382	5.760**	0.389	5.453**	0.406
Materialist+			-.598**	0.175	-.583**	0.177
Mixed+			-.571**	0.148	-.550**	0.150
Scale of Incomes (Higher value= higher income)	.118**	0.031			.110**	0.030
Self Positioning on Political Scale (Higher value= more conservative)	-.118**	0.031	-.090**	0.031	-.101**	0.032
Religious Person Nonreligious(1) vs. Religious(0)	-0.257*	0.125	-.339**	0.123	-.306*	0.125
Age	.016**	0.003	.015**	0.003	.015**	0.003
Highest Educational Level Attained (Higher value= higher level attained)	.273**	0.044	.284**	0.041	.252**	0.044
Adjusted R^2		0.083		0.078		0.090

Source: 2005-2008 World Values Survey
* Regression is significant at .05 level **Regression is significant at .01 level +Reference group= Post-materialists

Direct Effects Hypothesis. Column A in each of the regression tables shows the results for the direct effects hypothesis test. The affluence variable, (scale of incomes), was a significant predictor of pro-environmental attitudes only for the United States and Uruguay samples, although this relationship was rather weak. Multivariate analysis of the United States' data produced an adjusted R-square of .083 in testing the direct effects hypothesis, with included all independent variables producing a significance of at least .05. Multivariate analysis of Uruguay's data produced an adjusted R-square of only .011, and the variable self positioning on political scale was the only independent variable to produce a significance of at least .05, although this relationship was also weak. For individuals from the United States and Uruguay, 91.7% and 98.9%, respectively, of the variation in pro-environmental attitudes can be explained by factors not included in the model.

Indirect Effects Hypothesis. The regression analyses for testing the indirect effects hypothesis are shown in columns A through C. Because Sweden and Morocco did not pass the direct effects hypothesis test (A), the indirect effects hypothesis cannot be assumed for these two samples. For the Uruguay sample, neither of the dichotomized post-materialist variables indicated a significant relationship with the index support for the environment. Therefore, this finding suggests that post-materialist values are not associated with pro-environmental attitudes for individuals from Uruguay. The variable self positioning on political scale was the only other significant predictor, indicating that liberals hold more pro-environmental attitudes relative to conservatives. This sample produced an adjusted R-square of only .004, indicating that 99.6% of the variation in pro-environmental attitudes can be explained by other factors not included in this model.

For the United States' sample, the dichotomized post-materialist variables indicated a negative, significant relationship with the index support for the environment, with all included independent variables producing a significance of at least .01. Therefore, this finding suggests that post-materialist values are associated with pro-environmental attitudes, with post-materialists holding more pro-environmental attitudes relative to individuals with mixed and materialist values. This sample produced an adjusted R-square of .078, indicating that 92.2% of the variation in pro-environmental attitudes can be explained by other factors not included in this model.

The United States' sample was the only one that met the first two requirements for the indirect effects hypothesis. In Table 4.4, column C, the affluence variable is still shown to be a significant predictor of pro-environmental attitudes indicating that this sample does not fill the last requirement for this hypothesis to be true. Therefore, these findings do not support the indirect effects hypothesis. Rather, post-materialist values appear to be independent predictors of pro-environmental attitudes, which have a stronger influence than affluence for individuals from the United States.

Control Variables. The relationship between the control variables and pro-environmental attitudes is discussed from the regression analyses testing the indirect effects hypothesis in column C. For the samples from the United States, Sweden, and Uruguay, political orientation was found to be a significant predictor of pro-environmental attitudes, although this relationship was weak to moderate. Individuals identifying themselves as more liberal had more favorable attitudes towards the environment than individuals identifying themselves as conservative. This finding is consistent with past research (e.g. Klineberg et al. 1998).

Religiousness and age were found to be significant predictors of pro-environmental attitudes for only the United States sample. Nonreligious individuals hold less favorable attitudes towards the environment relative to religious individuals, which is inconsistent with past research findings (e.g. Klineberg et al. 1998). Younger individuals from the United States show slightly more support for the environment, yet this relationship is rather weak. Similar to past research findings (e.g. Klineberg et al. 1998; Kemmelmeier et al. 2002; Marquart-Pyatt 2007), age produced inconsistent results pertaining to its relationship with pro-environmental attitudes for different samples.

Education was found to be a significant predictor of pro-environmental attitudes for the samples from the United States, Sweden, and Morocco. Higher levels of education were associated with more favorable attitudes towards the environment. This relationship was reproduced for all three regression analyses indicating that education has a direct effect on individuals' attitudes towards the environment. Past research has produced consistent results (e.g. Kemmelmeier et al. 2002 and Gelissen 2007). It is surprising that education does not stand as a significant predictor of environmental attitudes for the sample from Uruguay since a larger percentage of individuals have attained higher levels of education than individuals from Morocco (Table 2). Yet, education remains significant for individuals from Morocco.

DISCUSSION

The present study found varying support for the direct effects hypothesis as to whether affluence is a significant predictor of pro-environmental attitudes. Past research has also produced varying results pertaining to economic indicators, but there are a number of reasons why these discrepancies could exist. As stated in the review of literature, different measures of pro-environmental attitudes produce varying relationships with a number of factors (Klineberg et al. 1998; Marquart-Pyatt 2007). This study utilized the index support for the environment, which is constructed of three questions pertaining to an individual's willingness to incur costs on behalf of the environment.

The index produced an acceptable Cronbach's alpha for the United States (α=.662) and Sweden (α=.764) samples, but less acceptable alphas for the Morocco (α=.595) and Uruguay (α=.544) samples. Therefore, the use of this index as a measure of pro-environmental attitudes for the samples from Morocco and Uruguay is not necessarily reliable. These low alphas are perplexing since past studies (e.g. Kemmelmeier et al. 2002) have implemented the same index and have produced well above .7 reliable alphas. Even though Kemmelmeier et al. (2002) analyzed different data (1993 International Social Survey Programme), these varying alphas for the same index generate

concerns about the different sampling methods used by the two surveys, and obviously, the overall reliability of the index as a measure of pro-environmental attitudes.

Past research has found this index to be related to post-materialist values and economic indicators (e.g. Lee and Kidd 1997; Kemmelmeier et al. 2002; Dunlap and York 2008). However, many researchers have indicated concerns over the use of this index; it has the potential to deflate pro-environmental attitude scores for poorer nations as the questions can be viewed as an individual's ability to pay rather than their willingness to pay for the environment (Brechin and Kempton 1994; Brechin 1999; Dunlap and York 2008). As stated above, the lower mean index scores for Morocco, a lower middle-income nation, and Uruguay, an upper middle-income nation, (indicating less support for the environment in terms of incurring costs to prevent or reduce pollution), could be attributed to this concern (Table 2). Future research should include multiple measures of pro-environmental attitudes to ensure acceptable reliability for samples from different countries.

These reliability concerns also pertain to the use of different economic indicators. In this study, the economic indicator used was an individual's subjective placement on their country's income scale. This is an important variable to analyze because individuals who share nearly the same incomes from two different countries can have completely different standards of living based on the size of income disparities in each country. However, the use of this variable also presents a limitation to the study: there is a tendency for individuals to identify themselves as "middle class" as we can see is the case from the mean income scores from Table 2. Just as Kemmelmeier et al. (2002) suggests, future research should examine the reliability of different economic indicators and their relationship with different measures of environmental attitudes.

Some studies have analyzed the relationship between national wealth and mean environmental attitude scores to allow for societal level analyses. This could also explain why economic indicators produce varying results with different measures of environmental attitudes (Brechin and Kempton 1994; Brechin 1999; Gelissen 2007; Dunlap and York 2008; Duroy 2008). Kemmelmeier et al. (2002) found that economic indicators can be sufficient predictors of pro-environmental attitudes at the societal level, but produce inconsistent results at the individual level.

In the present study, it is interesting that affluence is not a significant predictor of pro-environmental attitudes for both high-income nations' samples (United States and Sweden). Rather, one high-income nation (the United States) and one upper middle-income nation (Uruguay) found affluence to be a significant predictor, although these relationships were both rather weak. Following the Post-Materialist Value Theory, if affluence is such a critical building block for the creation of pro-environmental attitudes, the inclusion of the affluence variable in the regression models should generate a larger amount of variance explained in the index. For individuals from Sweden and Morocco, Tables 4.3 and 4.1 show us that the amount of variance explained in the index support for the environment slightly increases with the exclusion of the affluence variable. This should be translated to policy makers as supportive evidence that economic factors are not necessarily the root cause of pro-environmental attitudes.

Only the United States and Uruguay samples were able to be tested for the indirect effects hypothesis since they were the only countries to pass the direct effects hypothesis test. Neither of the samples indicated that the relationship between affluence and pro-environmental attitudes was mediated by post-materialist values. For individuals from the United States, post-materialist values appear to be independent predictors of pro-environmental attitudes, which are more influential than personal affluence. These results are consistent with those of Kemmelmeier et al. (2002): "Apparently, post-materialism cannot account for how economic prosperity, one of its critical antecedents, influences environmentalism, one of its alleged consequences" (278).

Also, Ingelhart's Post-Materialist Value Theory hypothesizes that "wealthy countries should have higher levels of post-materialism than poorer societies" (Abramson and Ingelhart 1995:143, as cited in Dunlap and Mertig 1997:24). From Table 2, we can see this is not completely supported: Uruguay, an upper middle income nation, has a larger number of individuals who hold post-materialist values than the United States, a high income nation. In addition, Uruguay holds nearly the same number of post-materialists as Sweden, which is also a high-income nation; yet, post-materialist values were only found to be significant predictors of pro-environmental attitudes for the sample from Sweden, not Uruguay. Even though the two high-income nations (United States and Sweden) did not hold a larger number of post-materialists, they were more likely to show greater support for the environment relative to the lower middle (Morocco) and upper middle-income (Uruguay) nations. These findings lend only partial support for Ingelhart's Post-Materialist Value Theory.

None of the control variables were found to be consistently significant for all four country samples. Higher levels of education are positively associated with pro-environmental attitudes for individuals from the United States, Sweden, and Morocco, while conservatives are negatively associated with pro-environmental attitudes for individuals from the United States, Sweden, and Uruguay. Due to the very low amount of variance explained in each of the regression models, it can be inferred that there are numerous other factors, which need to be explored in

their relation to predicting pro-environmental attitudes; affluence does not stand as the pivotal precursor for the existence of environmentalism. Therefore, the findings of this study suggest that environmentalism cannot be completely explained by a cultural value shift from materialist to post-materialist. Rather, it appears that pro-environmental attitudes emerge from multiple facets that vary by the society under examination.

CONCLUSION

The findings of this study indicate only limited and partial support for Ingelhart's Post-Materialist Value Theory. The results indicate that higher levels of affluence do not necessarily increase pro-environmental attitudes in every society, which has all too readily been accepted as reliable conventional wisdom. Therefore, pro-environmental attitudes should not be thought as being confined to only wealthy, industrialized nations. Policy makers should embrace these findings: "Rather than pushing narrowly for economic growth and hoping that it will result in increased affluence and thus citizen concern for the environment, policies that recognize the inherent link between ecological and economic sustainability may prove more popular as well as efficacious" (Dunlap and York 2008:551). Future research should incorporate historical information relating to nations' evolving political and economic structures to help portray how individuals are able to share the same attitudes towards the environment, despite having acquired them through different means and under different circumstances.

Also, just as multiple studies have concluded (Brechin and Kempton 1994; Dunlap and Mertig 1997; Engel and Pötschke 1998; Brechin 1999; and Dunlap and York 2008), future research studies need to analyze numerous variables in their explanatory power of pro-environmental attitudes since there is no one group of factors which impact each society the same. Furthermore, future research should take into consideration the varying relationships which are produced from different measurement tools of pro-environmental attitudes, as well as other factors such as affluence indicators (Klineberg et al. 1998; Marquart-Pyatt 2007). This study lends evidence to the growing body of research, which has found environmentalism to be a diverse movement which cannot be explained by one, universal explanation, such as the Post-Materialist Value Theory. "In short, environmentalism is most likely a complex social phenomenon, a mixture of social perceptions, local histories and environmental realities, international relationships and influences, and unique cultural and structural features of particular countries and regions" (Brechin 1999:807).

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