Research Note

The Influence of Gender, Race, & Party Identification on Attitudes about Global Warming

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This research note attempts to fill a gap in the literature pertaining to environmental values. We specifically look at the role of age, race, gender, social class, community type, and political ideology in influencing an individual's attitudes about global warming. The data set was created from the General Social Survey (GSS) and the 2006 Science Topical Module, which asked specific questions about global warming. Does the Van Liere and Dunlap (1980) paradigm of an environmentalist hold true today as it did in the 1970s? In addition to our analysis of this paradigm, we have included a short section on the role of perceived scientific knowledge on the global warming attitudes held by men and women. Do individuals with higher levels of scientific knowledge have more positive attitudes about global warming? The results of our regression models show that gender, party identification, education, race, and income have an influence on an individual's concern about global warming.

In the years that have passed since the establishment of Earth Day in 1970, environmental values have become ensconced in the collective consciousness of American society. Environmental education programs have been integrated into school curriculums, environmental groups have become a part of mainstream society, and green products now grace the shelves of our local grocery stores. Documentaries such as *An Inconvenient Truth* (2006) and Tribeca Film Festival winner *Who Killed the Electric Car?* (2006) have found an audience among ordinary Americans. Journalist Chris Mooney (2005) has questioned the "Republican war on science" while conservative idol Newt Gingrich's recent book, *A Contract with the Earth* (2007), calls for bipartisan solutions to the environmental challenges facing today's global society. Even companies that have traditionally been cast as environmental villains are trying to soften their corporate image through both program sponsorships and extensive advertising campaigns.

While environmentalism has become a household word, contemporary research on individual environmental attitudes is currently lacking in the field of political science. In the early 1980s, this was a robust field of research, rooted in an article by Van Liere and Dunlap (1980) that identified a "new environmental paradigm." Researchers during this time period painted a picture of an environmentalist who was a young, liberal and elite Democrat. Contemporary research has focused more on the environmental attitudes of children and the success of educational programs (Eagles & Demare, 1999; Bradley, et al., 1999; Hsu and Roth, 1996), specific sectors of the educational community (Benton, 1994), the economic controversies that taint many agro-environmental regulations (Hoiberg & Bultena, 1981; Goldstein, 1991), and the policy problems associated with environmental justice issues (Bullard, 2000; Lerner, 2004).

Even though there has been a dearth of articles in peer-reviewed journals, more recent information about environmental attitudes can be found in working papers that are accessible via the Internet. For example, the Yale Center for Environmental Law and Policy recently conducted an environmental survey that examined attitudes related to energy use and global warming.[1] The researchers found that 93 percent of Americans believed that dependence on foreign oil was a serious problem and that 94 percent of Americans felt it was a good idea to require the automotive industry to manufacture more fuel efficient vehicles. Furthermore, 83 percent of those surveyed felt that global warming was a serious problem, an increase of 13 percent since 2004.

This research note attempts to fill a gap in the literature pertaining to environmental values. We specifically look at the roles that age, race, gender, social class, community type, and political ideology play in influencing an individual's attitudes about global warming. The data set was created from the General Social Survey (GSS) and the 2006 Science Topical Module, which asked specific questions about global warming. Does the Van Liere and Dunlap (1980) paradigm of an environmentalist hold true today as it did in the 1970s? In addition to our analysis of this paradigm, we have included a short section on the role of perceived scientific knowledge on the global

warming attitudes held by men and women. Do individuals with higher levels of scientific knowledge have more positive attitudes about global warming?

YOUNG, LIBERAL & ELITE: A HISTORICAL PORTRAIT OF AN ENVIRONMENTALIST

The idea that environmentalists are generally young, liberal, and elite can be linked to a 1970s research agenda that focused on what Van Liere and Dunlap (1980) termed the "social basis of environmental concern." Five hypotheses dominated the literature of this decade: (1) the age hypothesis; (2) the social class hypothesis; (3) the residence hypothesis; (4) the gender hypothesis; and (5) the political hypothesis.

The Age Hypothesis**.** The *age hypothesis* stipulated that younger individuals tend to express more environmental concern than older people. The argument is based on the idea that younger people are less integrated into the American economic system. As the solutions to environmental problems are seen as threatening to the existing social order, it is reasonable to expect that older people who are more "connected" to the economic system will be less environmentally concerned than their younger counterparts (Van Liere & Dunlap, 1980). Studies by Tognacci, et al., (1972), and Buttel and Flinn (1978) confirmed that age was indeed negatively correlated with environmental concern.

Van Liere and Dunlap (1980) built upon this research to develop an adapted interpretation of the age hypothesis based on Mannheim's (1952 [1923]) conception of generations. They suggest that exposure to the "youth movement" of the 1960s and 1970s may help account for the environmental concern expressed by the younger generation. If this interpretation of the age hypothesis is correct, it may account for more recent findings that age is not a significant indicator of environmental concern (Scott & Willits, 1994). The "young" generation of the 1970s is now more mature, but its members may have held on to the environmental attitudes cultivated during their younger days. As today's youth are exposed to environmental education programs and – quite possibly – the environmental ideology of their parents, they will also be environmentally concerned. With several generations building positive attitudes, age would cease to be a factor.

- **Hypothesis 1.** *The younger an individual is, the more positive his or her environmental attitudes will be.* Although Van Liere and Dunlap (1980) have an interesting interpretation of the age hypothesis, we contend that there is a temporal effect to environmental education. That is, people who have been more recently exposed to environmental education in formal settings – such as high school and college – will have more positive attitudes.

The Social Class Hypothesis**.** The *social class hypothesis* stated that environmental concern is positively associated with socio-economic status – traditionally indicated by education, income, and occupational prestige. Based on Maslow's (1970) model of a hierarchy of needs, the hypothesis noted that environmental quality is a luxury good that will be strived for only after an individual's basic needs are met. Furthermore, Van Liere and Dunlap (1980) contend that the middle and upper class, being the more "politically and socially active" sectors of U.S. society, see environmental problems as an extension of their overall concern with social problems. In their study of the public's perception of pollution control, Althoff and Greig (1977) found that:

> In terms of socioeconomic characteristics, those respondents who were more concerned about the environmental issue, less trusting of both governmental and industrial efforts to solve the pollution problem, more dedicated to environmental protection, and more committed personally to aid in solving the pollution problem *tended to reside in urban areas, to be younger, to possess higher levels of education, and to have higher incomes…* (p. 451, emphasis ours)

The Tognacci, et al., (1972) study has a similar finding in that socioeconomic status and education were positively correlated with increased environmental concern. More recently, a study of elites in Taiwan by Hsu and Roth (1996) found that educational level is the best predictor of environmental attitudes. However, Scott and Willits (1994) found that while education and income were associated with increased environmental behavior, the extent of this relationship has been greatly exaggerated. Even in 1980, Van Liere and Dunlap warned that the support for socioeconomic status rested primarily on the strong relationship of education and environmental concern. Based on these studies, the following hypotheses were formulated:

- **Hypothesis 2.** *Individuals with higher levels of education will have more positive environmental attitudes*.
- **Hypothesis 3.** *Individuals with higher income levels will have more positive environmental attitudes.*

The Political Hypothesis. The *political hypothesis* considered both party identification and political ideology. The basic conception is that Democrats and liberals are more concerned about the environment than Republicans and conservatives. Van Liere and Dunlap (1980) attributed this relationship to three explanations. First, environmental reforms are generally opposed by business and industry because of the perceived cost of said reforms. Second, environmental reforms necessitate an expansion of government activities and regulations – which conflicts with the philosophy of

Republicans and conservatives. Finally, environmental reforms often require innovative action, which may affect the status quo.

In a 1975 study, Dunlap found that Republican and conservative students continually indicated lower levels of pro-environmental attitudes and actions than did Democratic and liberal students. Buttel and Flinn (1978) also found that Republicans tended to resist environmental reform while Democrats favored these reforms. They contended that political ideology explained most of the correlation of party and reforms. Other studies (Tognacci, et al., 1972; Scott & Willits, 1994) also determined that political liberalism was associated with environmental attitudes and behavior.

Recent polling data also finds a distinct divide between the two parties on environmental issues. For example, an October 2007 Harris Poll found that only 10 percent of Democrats believed that there was "too much" government regulation of the environment, compared to 34 percent of Republicans. On the same question, 68 percent of Democrats stated that there was "too little" government regulation, compared to 36 percent of Republicans.[2] Another poll found that Democrats were more likely to rank global warming as one of several important issues in determining who to vote for in the 2008 congressional elections. In this same poll, which was conducted by *Newsweek* in August 2007, 62 percent of Republicans said that global warming was not an important factor.[3]

Based on these studies, the following hypothesis was formulated:

- **Hypothesis 4.** *People who identify with the Democratic Party will have more positive environmental attitudes than people who identify with the Republican Party. The environmental attitudes of Independents cannot be predicted*.

The Residency and Gender Hypotheses. Two minor hypotheses focused on *residency* and *gender*. In the case of residency, Van Liere and Dunlap (1980) noted that urban residents were more likely to be environmentally concerned than rural residents. The authors offered two explanations: first, city residents receive more exposure to pollution than rural residents and are more aware of environmental problems; and second, rural residents tend towards "extractive" industry jobs such as logging, fishing, and farming (see also Tremblay & Dunlap, 1978). More recently, Christianson and Arcury (1992) found limited support for a difference in rural and urban environmental attitudes.

When considering these issues, residency should be considered by community type with a separate indicator for employment in extractive industries. Today, the difference in the environmental attitudes of urban and rural residents may be minimal as environmental problems such as nonpoint source water pollution have had an effect on rural residents, especially those individuals who live in agricultural communities. Furthermore, employment in extractive industries should be similar to employment in manufacturing (also "extractive" in principle when looking at air pollution). Finally, employment in financial-related jobs might be correlated with negative environmental attitudes; logically, individuals in these fields would be concerned with increased government regulation. Therefore, we propose the following two hypotheses:

- **Hypothesis 5.** *There will not be a significant difference in the environmental attitudes of urban and rural residents*.
- **Hypothesis 6.** *People who are employed in extractive and financial industries will have more negative environmental attitudes than people with other occupations.*

In the case of gender, Van Liere and Dunlap (1980) cite conflicting evidence. Their view was that males were more environmentally concerned because of their greater involvement in and attention to politics. However, others have argued that men are more likely to be influenced by economics (i.e., "I need my job") whereas women are less challenged by these problems. These studies related to gender may be obsolete; in a society of two-job families, women may be as influenced by economic concerns as men.

Hayes (2001) offers a different perspective on gender differences. In her cross-national study on gender and scientific knowledge, she found that while men had higher levels of scientific knowledge, this did not have an effect on their attitudes towards the environment. Even when controlling for other factors (i.e., age, education, occupation, marital status, religion, and ideology), Hayes did not find a significant difference in the environmental attitudes of women and men.

More recent polling data supports Hayes' assertion that there is a knowledge gap between men and women. In the 2007 Yale study previously mentioned, 71 percent of men said that they could explain global warming to others, compared to 63 percent of women. In addition, 38 percent of men said they were familiar with the term "carbon neutral" compared to 27 percent of the women interviewed. However, unlike Hayes' study, the Yale survey found that there was a gender gap in environmental attitudes. Women were more likely to believe that the environment is getting worse (67 percent) than men (56 percent). In addition, 70 percent of women agreed with the statement that "Our country is in as much danger from environmental hazards such as air pollution and global warming as it is from terrorists." Only 56 percent of the men interviewed agreed with the same statement.[4] Given this information, we predict:

- **Hypothesis 7.** *Women will have more positive environmental attitudes than men.*

The Race Hypothesis. Early research on race and environmental attitudes found that Caucasians were more likely to express greater concern and awareness about environmental issues than African-Americans and other minorities. For example, Hershey and Hill (1977-78) found that this racial gap existed even when controlling for the effects of socioeconomic status, education, pollution levels in a community, exposure to information about pollution, and personal sense of efficacy. More recent research (Mohai & Bryant, 1998; Whittaker, Segura, & Bowler, 2005) has found that this gap has disappeared. In their survey of metro-area Detroit residents, Mohai and Bryant (1998) found that African-Americans were actually more concerned about local level pollution issues than their white counterparts, a finding that fits well with the growing body of research on the environmental justice movement (Bullard, 2000; Lerner, 2004). Whittaker, Segura, and Bowler (2005) had similar findings among non-white Latino/as in California, although these authors stipulated that minority groups were still less concerned about abstract environmental issues.

The distinction between proximate and abstract concerns makes it difficult to develop a hypothesis dealing with race. On one hand, we could argue that there race should not be a factor in environmental attitudes. However, our dataset focuses on attitudes about global warming, which is a more abstract – and distant – issue. For these reasons, we posit the following hypothesis:

- **Hypothesis 8.** *Whites will have more positive environmental attitudes than individuals of minority descent.*

DATA AND METHODS

The data for this cross-sectional study was derived from the General Social Survey (GSS) and the International Social Survey Programme (ISSP) 2006 Science Topical Module, which was downloaded from the Survey Documentation and Analysis website hosted by the University of California – Berkeley.[5] Six of the independent variables used in the regression model – *age*, *education*, *income*, *race*, *sex*, and *party identification* – were taken directly from the GSS dataset. Race, sex, and party identification were recoded for directionality. [For more information, see the codebook included in Appendix A.]

Three other independent variables were created using GSS data. A dichotomous variable, *urban*, was created from the GSS variable XNORCIZ; it is coded as 1 for urban residency and 0 for rural residency. In order to test the occupation hypothesis, two dichotomous variables, were created from the GSS variable INDUS80. The *finance* variable is coded as 1 for individuals who work in a financial field and 0 for individuals who work in other fields. The *extractive* variable is coded as 1 for individuals who work in an extractive field such as manufacturing or mining and 0 for individuals who work in other fields.

The dependent variable, *glwarmatt2*, is an index created from five variables in the 2006 Science Topical Module. In the module, the survey respondents received the following directions: "Scientists predict that global warming may soon have big effects on the polar regions. I will describe some of these possible effects and, for each one, please say whether it would bother you a great deal, some, a little, or not at all if it actually happened." They were then given five statements: (1) By 2020, polar bears may become extinct (*extinct*); (2) sea level may rise by more than 20 feet, flooding coastal areas (*sealevel*); (3) Arctic seals may be threatened (*artseals*); (4) Inuit and other native peoples may no longer be able to follow their traditional way of life (*inuitway*); and (5) the northern ice cap may completely melt (*noicecap*). Each of these five variables was coded on a scale of one to four. Thus, the index uses a scale of 1 – 16, with 1 equal to cares "not at all" about the issue and 16 equal to cares "a great deal."

We used the following regression model to test our eight main hypotheses:

$$\mathbf{Y_X} = \boldsymbol{\alpha} + \mathbf{age} + \mathbf{education} + \mathbf{income} + \mathbf{party\ identification} + \mathbf{sex} + \mathbf{race} + \mathbf{urban} + \mathbf{finance} + \mathbf{extractive}$$

Based on our hypotheses, we expected to find a negative relationship between age and global warming attitudes. We predicted that the income, education, party identification, gender, race, extractive, and finance variables would have be positively related to global warming attitudes. We did not expect to find a significant relationship between global warming attitudes and urban residence.

RESULTS OF THE REGRESSION MODEL

The results of the regression model can be found in Table 1. Overall, several of our variables performed as expected. We found significant positive relationships for education, income, party identification, gender, and race. Individuals with higher levels of education ($t = 1.688$; $p<.10$) and income ($t = 4.233$, $p<.01$) expressed more concern about global warming; this provides support for Van Liere and Dunlap's (1980) social class hypothesis. Furthermore, individuals who were strong Democrats also expressed more concern about global warming, which adds further evidence to the political hypothesis ($t = 3.358$, $p<.01$). Women were more likely than men to be concerned about global warming ($t = 2.558$; $p<.05$), while minorities were less concerned with global warming than whites ($t = 4.652$; $p<.01$). Finally, as predicted in our residency hypothesis, there was not a significant difference in the global warming attitudes of urban and rural residents.

TABLE 1. Influences on Global Warming Attitudes

Dependent Variable	β	t	p
Constant	8.206	10.103	.000
Age	-0.009	-1.187	.235
Education	0.078	1.688	.092*
Income	0.100	4.233	.000***
Party Identification	0.206	3.358	.001***
Sex	0.638	2.558	.011**
Race	1.452	4.652	.000***
Urban	0.392	1.365	.173
Extractive	-0.090	-0.286	.775
Finance	-0.208	-0.651	.515

n = 841; r = .293; r^2 = .086; F = 8.666 (sign. at p < .01)
* p < .01; ** p < .05; *** p < .10

We did not find support for the age hypothesis. Although an individual's concern over global warming decreased with age (β = -0.0009), the relationship between age and global warming attitudes was not significant (p = .235). It is possible that this particular dataset was affected by the growing media attention to global warming issues surrounding the release of the Al Gore film *An Inconvenient Truth*, which would have influenced the attitudes of young and old alike. Furthermore, working for an extractive industry (t = -0.286; p = .775) or in the financial sector (t = -0.651; p = .515) did not have an impact on an individual's level of concern about global warming. While it is possible that these two variables may influence an individual's overall attitudes about the environment, our suspicion is that the issue of global warming – with its broad media coverage – does not have an industry-specific impact.

GENDER, KNOWLEDGE & ATTITUDES: AN INITIAL EXPLORATION

After reviewing the results of the regression model, we developed two secondary research questions. Does scientific knowledge have an impact on an individual's concern about global warming? Furthermore, in response to Hayes' (2001) article, we wondered if there was a relationship between gender, scientific knowledge, and environmental attitudes. The results shared in this section are exploratory in nature; further work is needed to truly develop this particular strand of our research.

Initially, we used two variables (*knwsci* and *knwgw*) from the GSS/ISSP dataset, which were based on the respondents' self-reported level of knowledge about science/technology and global warming. A comparison of means tests demonstrated that individuals who self reported lower levels of knowledge about science and technology had less concern about global warming. The one exception to this pattern is that men who reported that they were very informed had a lower mean (12.33) than men who were somewhat informed (12.76). The same pattern held true for the relationship between self-reported knowledge about global warming and concern about the phenomenon. The means are shown in Table 2.

We were concerned that self-reported knowledge was not an accurate measure of an individual's scientific understanding. Using the GSS/ISSP data, we created an index measure from seven knowledge based questions. This new variable, *knowledge*, is coded on a scale of 0 – 7, where an individual who answered all of questions incorrectly would be coded as zero.[6] As a preliminary step, we conducted an independent samples t-test to see if men and women had different levels of knowledge about these issues. We found that women scored significantly lower than men on the knowledge measure (t = -8.668, p < .01). The results of the t-test can be found in Table 3.

Since we found a significant difference in the knowledge levels between men and women, we decided to run a regression model that included an interaction between gender and knowledge. In order to create the interactions in SPSS, a three step process was used. First the *knowledge* variable was centered by subtracting the mean from each data point in the set. This became our *kcenter* variable. The *kcenter* variable was then multiplied by the *sex* variable to create the interaction variable (*gndrknow*). Finally, we added the *gndrknow* variable to the original model and ran a two-stage linear regression to analyze the relationship.

The results of the new model can be found in Table 4. As with the previous model, we found the expected positive relationships between concern over global warming and income (t = 3.475, p < .01), party identification (t = 3.315, p <.01), gender (t = 3.394, p < .01), and race (t = 3.358, p < .01). We also found a significant positive relationship between scientific knowledge (t = 4.089, p < .01) and concern about global warming. However, the relationship between education and concern over global warming was no longer significant (p = .985). This is due to the correlation between the knowledge and education variables (r = .355, p < .01).[7]

Finally, the interaction variable was also not significant (t = 0.337; p = .737). Although women did have lower levels of scientific knowledge, there was not a gender specific impact on global warming attitudes. Our finding is in line with the Hayes' (2001) results.

CONCLUSIONS

Three decades have passed since Van Liere and Dunlap (1980) first articulated their portrait of a young, liberal elite environmentalist. Although some aspects of the paradigm are still applicable today, the portrait needs to

TABLE 2. Mean Scores, Global Warming Attitudes Index

	Science and Technology			Global Warming		
Level of Knowledge	**Men**	**Women**	**Total**	**Men**	**Women**	**Total**
Very uninformed	11.05	10.94	10.98	11.82	9.90	9.72
Somewhat uninformed	11.70	12.26	12.04	11.65	12.36	12.14
Neither informed or uninformed	12.32	12.80	12.60	12.97	11.76	11.72
Somewhat informed	12.76	13.22	13.02	13.23	13.59	13.32
Very informed	12.33	13.32	12.73	12.41	14.16	13.62

NOTE: The global warming attitudes index is scored on a scale of 0-16, with 0 equal to does not care at all about global warming.

be slightly modified. When it comes to global warming, age is not a factor. In this study, young and old alike have expressed their concern about global warming. Yet, there is a tendency for Democrats to be more concerned than Republicans, women to be more concerned than men, and whites to be more concerned than minorities. Income is also a factor; as income rises, individuals tend to be more concerned about global warming. However, we do not see a rural/urban divide over the issue; nor did we find a linkage between employment in an extractive industry or in the financial sector.

TABLE 3. Environmental Knowledge Level of Women and Men

t	p	Mean Difference	Standard Error
-8.836	0.000	-0.676	0.078

NOTES: Women: n = 1049; mean = 3.73. Men: n = 779; mean = 4.41. The knowledge index is scored on a scale of 0-7.

This study is not without its limitations. First, our analysis was limited by the availability of data. The most recent ISSP science-based module included questions about global warming, but not about other environmental issues. Therefore, we could not examine environmental attitudes in a broader context.[8] Furthermore, this data limitation had an impact on the development of our global warming index. The ISSP questions only captured "concern" about global warming, but did not include any action indicators (i.e., willingness to change lifestyle, pay more for gas, or pay higher taxes). Environmental attitudes tend to be shallow ones: individuals will often say they are concerned about the environment, but are not willing to make significant changes to help protect it (See Rosenbaum, 2008).

Second, both of our regression models had small r^2 values. In future studies, it may be useful to consider other influences on environmental attitudes, such as whether or not an individual has children. Ideology could also replace party as a variable in future models as it may be more proximate to an individual's environmental attitudes

Finally, although the interaction between gender and knowledge was not significant, it allowed us to develop the knowledge variable. In future papers, we may opt to use a knowledge test as opposed to educational level because it may be a more accurate measure of an individual's environmental knowledge.

NOTES

For a complete overview of their findings, see the *2007 Environmental Survey* published at: http://research.yale.edu/envirocenter/uploads/epoll/YaleEnvironmentalPoll2007Keyfindings.pdf (last accessed on February 26, 2008). These survey findings were based on a random sample of 1,017 American adults. The survey had an overall margin of error of +/- 3.07 percent at the 95 percent confidence level.

[2] Conducted from October 16-23, the Harris Poll interviewed 1,052 adults and had a margin of error of +/- 3 percent. The question was phrased as follows: "Do you think there is too much, too little, or about the right amount of government regulation and involvement in the area of environmental protection?" Results of the poll were published at http://www.pollingreport.com/enviro.htm (last accessed February 26, 2008).

TABLE 4. Gender and Knowledge as Influences on Global Warming Attitudes

Dependent Variable	β	t	p
Constant	9.663	11.686	.000
Age	-.004	-.595	.552
Education	.001	.019	.985
Income	.081	3.475	.001***
Party Identification	.199	3.315	.001***
Sex	.849	3.394	.001***
Race	1.047	3.358	.001***
Urban	.254	.900	.368
Extractive	-.103	-.334	.739
Finance	-.231	-.739	.460
Knowledge [1]	.481	4.089	.000***
Gender * Knowledge	.049	.337	.737

n = 841; r = .358; r^2 = .128; F = 11.135 (sign. at p < .01) | [1] These are the results for the *kcenter* variable.
* p < .01; ** p < .05; *** p < .10

[3] Conducted on August 1 and 2, 2007, by Princeton Survey Research Associates International, the *Newsweek* poll interviewed 1,002 adults and had a margin of error of +/- 4 percent. The question was phrased as follows: "How important will a candidate's views on global warming be in determining your vote for U.S. Congress next year? Will it be the single most important issue, or one of several important issues, or not important in determining your vote?" 70 percent of Democrats answered that global warming was one of several important issues. Results of the poll were published at http://www.pollingreport.com/enviro.htm (last accessed February 26, 2008).

[4] For a complete overview of their findings, see the *2007 Environmental Survey* published at: http://research.yale.edu/envirocenter/uploads/epoll/YaleEnvironmentalPoll2007Keyfindings.pdf (last accessed on February 26, 2008).

[5] The Survey Documentation & Analysis website is located at: http://sda.berkeley.edu/archive.htm.

[6] The seven variables used to create the knowledge index were: HOTCORE, RADIOACT, ELECTRON, VIRUSES, ICESHEET, NOSUN, and ICECAPS. See Appendix B for question wording.

[7] After determining that these two variables were correlated, we re-ran the model without the education variable. Although the beta coefficients shifted slightly, all five of the positive relationships remained significant at the p < .01 level.

[8] The ISSP will collect data for its next environmental module in 2010. See http://www.issp.org/data.shtml for more details.

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APPENDIX A. CODEBOOK

AGE
Respondent's age (Continuous Variable)

EDUC
What is the highest grade in elementary school or high school that you finished and got credit for? (Continuous Variable)

EXTRACTIVE
Does the respondent work in an extractive industry? (Dichotomous Variable; 1 = extractive industry; 0 = other industries). Created from the SPSS variable **INDUS80.**

FINANCE
Does the respondent work in the financial sector? (Dichotomous Variable; 1 = financial sector; 0 = other sectors). Created from the SPSS variable **INDUS80** (Respondent's occupation, prestige, and industry).

GNDRKNOW
The interaction between **SEX** and **KCENTER**.

GLWARMATT2
An index created from five variables included in the 2006 Science Topical Module. (16 point scale; 1 = cares not at all about global warming; 16 = cares a great deal about global warming). Created from five variables: **EXTINCT, SEALEVEL, ARTSEALS, INUITWAY,** and **NOICECAP**.

INCOME06
In which of these groups did your total family income, from all sources, fall last year -- 2005 -- before taxes, that is? (Ordinal Variable)

PARTYID2
Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what? (Ordinal Variable; 0 = Strong Republican; 6 = Strong Democrat). Created from the SPSS variable **PARTYID**.

KCENTER
The **KNOWLEDGE** variable centered for use in the second regression model.

KNOWLEDGE
An index created from seven variables included in the GSS/ISSP data. (0-7 point scale; 0 = all questions wrong). See Appendix B for the questions used to create the knowledge variable.

KNWSCI
For each of the following areas, please indicate whether you are very informed, somewhat informed, neither

informed nor uninformed, somewhat uninformed, or very uninformed about the issues: Science and Technology (Ordinal Variable; 1 = Very uniformed; 5 = Very informed)

KNWGW
For each of the following areas, please indicate whether you are very informed, somewhat informed, neither informed nor uninformed, somewhat uninformed, or very uninformed about the issues: Global Warming (Ordinal Variable; 1 = Very uniformed; 5 = Very informed)

RACE
What race do you consider yourself? (Dichotomous Variable; 1 = Caucasian; 0 = Minority)

SEX
Respondent's sex (Dichotomous Variable; 1 = Female, 0 = Male)

URBAN
Does the respondent live in an urban or rural area? (Dichotomous Variable; 1 = urban residency, 0 = rural residency). Created from the SPSS variable **XNORCSIZ** (Expanded N.O.R.C. Size Code).

APPENDIX B. THE KNOWLEDGE VARIABLE

The following variables were taken from the GSS/ISSP dataset to develop the KNOWLEDGE and KCENTER variables used in the second regression model.

Question wording 1: *Now, I would like to ask you a few short questions like those you might see on a television game show. For each statement that I read, please tell me if it is true or false. If you don't know or aren't sure, just tell me so, and we will skip to the next question. Remember true, false, or don't know.*

HOTCORE First, the center of the Earth is very hot.

RADIOACT All radioactivity is man-made.

ELECTRON Electrons are smaller than atoms.

VIRUSES Antibiotics kill viruses as well as bacteria.

Question Wording 2: *The next few questions are about the Arctic and the Antarctic. The Arctic is the region around the North Pole; Antarctic is the region that contains the South Pole. These questions are like ones you might see on a television game show. If you don't know or aren't sure, just tell me so, and we will skip to the next question. Remember true, false, or don't know.*

ICESHEET The North Pole is on a sheet of ice that floats on the Arctic Ocean.

NOSUN The sun never shines at the South Pole.

ICECAPS Would you say the polar ice caps have gotten larger or smaller over the last 25 years?

Recoded: 1 = Right answer; 0 = Wrong answer (including "Don't Know" and "No Answer")