Published in final edited form as:

Soc Sci Q. 2014 March 1; 95(1): 57–75. doi:10.1111/ssqu.12045.

THE VARIED INFLUENCE OF SES ON ENVIRONMENTAL CONCERN

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Abstract

Objective—Cross-national studies have found positive relationships of socioeconomic status (SES) with environmental concern at the individual level but have not systematically examined how the relationships may differ across nations. Such comparisons have relevance to identifying the generality of theories of postmaterialism, affluence, and global environmentalism.

Methods—This study specifies how the individual-level influence of SES varies across national contexts and tests predictions using four waves of the World Values Survey on up to 96 nations.

Results—The results show that SES is associated only weakly with environmental concern in lower income nations with poor environmental conditions but is associated strongly and positively in higher income nations with better environmental conditions.

Conclusion—SES has a contingent relationship with environmental concern such that the global environmentalism theory receives support for lower income nations, while the postmaterialism and affluence theories receive support for higher income nations.

A large body of literature has examined the question of whether the socioeconomic status (SES) of individuals increases their environmental concern. A short answer is yes. Although the relationships are modest and differ to some degree for education, occupation, and income, studies across a variety of nations find that the SES components generally have positive relationships with environmental concern. For example, a comparison across 19 advanced industrial and former Communist nations demonstrates consistently positive effects of education, and generally positive effects of income, on pro-environmental attitudes and behaviors (Marquart-Pyatt 2008). Other studies similarly document positive, individual-level associations of environmental concern with education, income, and subjective class (Franzen and Meyer 2010; Gelissen 2007; Givens and Jorgenson 2011). The association with income and occupation tends to be more consistent than that for income (van Liere and Dunlap 1980), but recent cross-national studies supply evidence of generally positive relationships.

However, relationships that are positive on average in multi-country studies leave another question unanswered: To what extent does the strength of the influence of SES components on environmental concern differ across nations? The relationships may vary around the average such that some countries show no influence (or even negative influence) while others show strong positive influence. This question shifts the focus from the typical relationship among individuals within countries to variation in relationships across countries. The variation can be large. Marquart-Pyatt (2008) reports that the unstandardized coefficient for education varies by a factor of 4.6 (from .008 for Spain to .037 for Japan), and Kemmelmeier, Król, and Kim (2002) report that the standardized coefficient for

education varies by a factor of 8.3 (from .036 in Northern Ireland to .300 in Hungary). From a cross-national perspective, the size of SES differences defines a meaningful outcome for explanation and study.

This idea has theoretical importance. Adopting different perspectives on the motivations for environmentalism, postmaterialism and affluence theories predict positive relationships of SES components and environmental concern, while theories of global environmentalism predict zero or negative relationships. The observed positive relationships would seem to support the postmaterialist and affluence theories. However, if the SES relationships vary across countries, theoretical conclusions may be premature – support may emerge for multiple theories once recognizing the importance of national context.¹

In examining the varied influence of SES on environmental concern across countries, this study attempts to use insights from several theories and, at least to a partial degree, bridge competing theoretical arguments. The next sections 1) briefly review existing theories of socioeconomic sources of environmental concern, 2) offer an alternative approach and hypotheses that specify variation across nations in the relationship, and 3) present tests of the hypotheses generated by the alternative approach with data from the World Values Survey. Although the components of SES are not identical, they similarly reflect inequalities in access to valued social and economic resources and have commonalities in influencing views of the environment. The theoretical sections thus speak of SES in general, but the empirical section examines indicators of each component.

The Debate

Post-Materialist Values

Ronald Inglehart (1995) and others (Abramson 1997; Kidd and Lee 1997) argue that high SES groups show greater support for the environment because they are most likely to have adopted postmaterialist values. Postmaterialism refers to adherence to values of self-expression, subjective well-being, and quality of life that foster concern with issues such as environmentalism, feminism, and equality, while materialism refers to values of economic and physical security that foster concern with economic growth and maintaining order. The unprecedented degree of wealth and economic security experienced by post-World War II generations in industrialized societies led to a societal shift from materialist to postmaterialist values, which in turn led to greater environmental concern. At the micro level, advanced education and economic opportunities of high SES individuals promote the adoption of postmaterialist values and pro-environmental views. SES and postmaterialism should influence individual environmental concern across diverse contexts.

However, Inglehart (1995) adds a qualification to these claims. He argues that poor objective environmental conditions can counteract the importance of subjective postmaterialist values. Although he makes this point in regard to cross-national comparisons, the logic applies to individual SES. Poor objective conditions experienced by low SES groups may heighten environmental concern independent of postmaterialism and weaken SES differences.

¹Interestingly, macro-level studies of the widest samples of nations available demonstrate inconsistent relationships between national income and environmental concern and support the global environmentalism theory (Dunlap and York 2008; Givens and Jorgenson 2011; Knight and Messer 2012). Positive effects at the micro-level suggest some inconsistency between the micro and macro-level results. Attention to national variation in the influence of SES may help resolve inconsistent findings across levels.

Affluence

A second argument makes a similar prediction of positive relationships of SES with environmental concern, although it specifies another mechanism. Emphasizing the economic calculations made by rational actors, an affluence argument treats environmental quality as an amenity good that high-income individuals can most readily afford (Franzen and Meyer 2010). Based on the elasticity of demand for a quality environment, SES should influence environmental concern without requiring value change. Positive associations of SES with environmental concern can emerge without adoption of postmaterialist values, particularly when environmental action has behavioral and monetary costs (Diekmann and Preisendörfer 2003; Diekmann and Franzen 1999; Franzen 2003; Meyer and Liebe 2010).

Advocates of the postmaterialist and affluence arguments, noting differences in types of environmental concern, generally favor measures of the willingness to pay for environmental improvement (Gelissen 2007; Kidd and Lee 1997). They argued that willingness to pay better taps deeply held views than more general approval of environmental protection. Absent economic cost, favorable opinions about protecting the environment may be so easily adopted as to have little relationship with postmaterialism or affluence. In contrast, measures of willingness to pay better isolate postmaterialist from materialist forms of environmental concern (Inglehart 1995). Others claim, however, that financial measures bias comparisons toward affluent groups (Dunlap and York 2008).

Global Environmentalism

A third approach contends that environmental concern is not a privilege restricted to the secure and affluent. Instead, advocates argue that a “global environmentalism” has emerged which includes support for environmental improvement by socioeconomically disadvantaged populations within relatively poor countries (Brechin 1997, 1999). The logic behind the claim is that disadvantaged individuals often depend more directly on local environments and have greater exposure to environmental ills (Buttel and Flinn 1978). As such, they have substantial motivation for environmental conservation, as evidenced by vibrant grassroots environmentalism in many less developed settings (Dunlap and Mertig 1995, 1997). There are clear socioeconomic inequalities in environmental exposure and negative impacts due to environmental degradation – with disadvantaged groups more likely to experience adverse environmental conditions (Brulle and Pellow 2006). Conversely, relatively advantaged groups and countries can better afford to protect themselves from myriad environmental insults (Brechin and Kempton 1994). In this way, objective environmental problems faced by less advantaged individuals may stimulate environmental engagement of the poor and lead to zero or negative relationships between SES and environmental concern (Adeola, 2004; Martinez-Alier, 2002).

The global environmentalism theory receives support at the cross-national level (Dunlap and Mertig 1995; Brechin 1999; Dunlap and York 2008; Givens and Jorgenson 2011; Knight and Messer 2012). Even willingness-to-pay measures, expected to be biased toward a direct relationship with national income (Brechin 1999) because the rich can devote money to support environmental actions and the poor can devote only time and effort (Brechin and Kempton 1994; Kim 1999), have an inverse relationship to national product in these studies. As noted, however, evidence shows positive rather than negative SES relationship at the individual level.

Alternative Approach

To briefly review, postmaterialist and affluence theories predict positive relationships between SES and environmental concern, while global environmentalism theory predicts zero or negative relationships. The micro-level evidence on SES confirms a positive

relationship, but a problem may come from the assumption of most theories and studies that SES has invariant relationships with environmental concern. If, in contrast to the assumption, the relationships vary across countries, some countries may show positive relationships, while others show nil or negative relationships. The key is to identify national sources of the differences.

I offer an alternative approach focused on two macro-level characteristics – national income and environmental quality – that have proven important for the level of environmental concern and likewise may prove important for the micro-level influence of SES. An integrative hypothesis posits that SES effects – or SES disparities – are smallest in countries with low national income and poor environmental conditions, and they are largest in countries with high national income and better environmental conditions. The predictions of the global environmentalism theory of weak SES influence thus apply most to the former group of countries and predictions of the postmaterialism and affluence theories of positive SES influence apply most to the latter group of countries. This hypothesis encompasses three claims.

First, industrializing countries that have moved from traditional agriculture to a growing manufacturing base face the most pollution, the greatest environmental degradation, and the worst environmental conditions. In contrast, higher-income nations with postindustrial economies enjoy better environmental conditions. Building on evidence of an environmental Kuznets curve (Grossman and Krueger 1995), the 1992 World Development Report (World Bank 1992) proposed that economic growth leads to the worst environmental degradation in the early stages of the development process. Inglehart (1995) similarly highlights evidence of greater water and air pollution in low- and middle-income countries and substantial declines in pollution since 1970 in high-income countries. Developers of the Environmental Sustainability Index (Yale Center 2001:14) make the case empirically. The index has a correlation of .76 with GDP per capita. The sources of the improvement in higher income countries are diverse: the decline of many high polluting manufacturing industries, greater resources to devote to environmental protection, and stronger commitment of governments to environmental policy. But more important than the sources of different environmental conditions is the existence of a positive relationship between environmental conditions and national income.

Second, the severe environmental threat in industrializing nations tends to level or attenuate individual SES differences. With unpleasant, unaesthetic, and unhealthy environmental conditions, the affluent and poor alike in lower-income countries may express concerns about environmental quality. In rural communities, both landowners and poorer tenants may oppose the loss of farmland, woodlands, and open space to industrialization, making ruralism a source of environmentalism (De Shalit 1996). In urban communities, both the middle class and poor may oppose the mounting pollution of air and water from factories and automobiles (Kim 1999). Still further, diverse SES groups in industrializing nations may unite in their concern about the harm of exploitation of natural resources by foreign corporations (Brechtin and Kempton 1994). With low income and poor environmental conditions, then, SES will do little to distinguish support for environmental quality. Based on this reasoning, the global environmentalism arguments and the prediction of high environmental concern among low SES groups may apply most to less affluent nations with poor environmental conditions. In contrast, the postmaterialist and affluence arguments and the prediction of high environmental concern among high SES groups may not apply because the environmental threat overrides the importance of amenity and postmaterialist motivations (Inglehart 1995).

Third, improved environmental conditions in high-income nations tend to facilitate the importance of SES differences for environmental concern. To the extent that richer countries with postindustrial economies can moderate pollution and environmental threats to health, environmental concern becomes more a quality-of-life concern of affluent groups with postmaterialist values. The result is to strengthen the positive relationship between SES and environmental concern (and between postmaterialism and environmental concern). This claim is consistent with findings of positive SES relationships in studies of high-income nations (Marquart-Pyatt 2008). It also fits the findings of Franzen and Meyer (2010) that the effect of postmaterialism becomes stronger with higher GDP and the findings of Inglehart (1995) that subjective values emerge as more important under better objective environmental conditions. Thus, the affluence and postmaterialist arguments apply best to high-income countries.

Hypotheses

The hypotheses move beyond efforts to test the postmaterialist, affluence, and global environmental arguments by examining the additive influence of SES, national income, and environmental quality on environmental concern. Rather, the hypotheses are interactive and specify how the influence of SES varies across national contexts.

H1. The influence of SES on environmental concern will strengthen with national income, such that individuals in nations with lower income show weak SES differences and individuals in nations with high income show strong SES differences. Equivalently, national income affects environmental concern more among low SES groups than high SES groups.

H2. The influence of SES on environmental concern will strengthen with environmental quality, such that individuals in nations with poor environmental conditions show weak SES differences and individuals in nations with better environmental conditions show strong SES differences. Equivalently, environmental quality affects environmental concern more among low SES groups than high SES groups.

The hypotheses imply support for the global environmentalism predictions of weak SES differences in nations with lower income and worse environmental conditions and support for the postmaterialism and affluence arguments of strong SES differences in nations with higher income and better environmental conditions. The hypotheses can further distinguish between the affluence and postmaterialist arguments by examining the varied influence of postmaterialism along with the varied influence of SES. The influence of postmaterialism on environmental concern may increase with national income and environment quality much as the influence of SES does.

Methods

Data

The analysis uses the last four waves of the World Values Survey or WVS (World Values Survey Association 2012), each having multiple questions on environmental concern and containing a diverse set of nations. The WVS includes 43 nations in the 1989–1993 or second wave, 54 nations in the 1994–1999 or third wave, 70 nations in the 1999–2004 or fourth wave, and 70 nations in the 2005–2008 or fifth wave. Together, the four waves have surveys for 96 nations and 224 nation/waves.² The surveys cover all regions and levels of development of the world. The regional distribution of nations is: Eastern Europe (23),

²The count treats Northern Ireland as separate from Great Britain and East Germany as separate from West Germany. The vastly different political histories and socioeconomic conditions of these regions justify their separate treatment.

Africa (11), Middle East (9), Latin America (13), South East Asia (13), and Western Europe and other high income nations (27). However, missing data on environmental items will reduce these numbers.

For each nation included in the WVS, the investigators selected, as best as possible, nationally representative samples of adults (WVS 2012). The samples from high-income nations meet quality standards for probability sampling, but some nations use quota sampling. Still, data from such a diverse sample of low- and middle-income nations offer valuable information. Although some nations include respondents as young as age 15, I examine respondents age 18 and over. Replicating the results for ages 25 and over, when SES and attitudes have more fully crystallized, does little to change the results.

Outcome Measures

The WVS contains numerous environmental items that can be narrowed down by specifying three requirements: 1) repetition for three or more waves, thus incorporating temporal as well as cross-national variation, 2) support that encompasses some sort of economic tradeoff, thus sharpening the potential for divergent responses, and 3) a focus on attitudes and beliefs, thus minimizing the importance of structural impediments to recycling and joining an environmental movement in lower-income nations. The criteria define three measures for analysis. The multiple measures provide for some robustness of results, while at the same time focusing on similar dimensions of environmental concern.

1. **Willingness-to-Pay Scale.** Waves 2, 4, and 5 ask three questions related to willingness to pay for environmental protection. Using choices ranging from 1) strongly disagree to 5) strongly agree, respondents are asked their opinion about the following statements: I would give part of my income for the environment, I would agree to an increase in taxes if the extra money were used to prevent environmental pollution, and the government should reduce environmental pollution. The scale has an alpha coefficient of .652.
2. **Willingness to Pay Higher Taxes.** One item in the willingness-to-pay scale, agreement to pay more taxes to prevent environmental pollution, is available for all four waves and a substantially larger set of nation-years than the other two items. Given its more extensive availability, it is examined separately as well as part of the scale (it has a correlation of .83 with the scale). However, the wider sample comes at the cost of the lower reliability for a single item.
3. **Willingness to Accept Slower Economic Growth.** An item used in waves 3, 4, and 5 asks respondents if protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs, or if economic growth and creating jobs should be the top priority, even if the environment suffers to some extent. It is coded with values from 1 (growth), 2 (other), and 3 (protect the environment). This single item will have lower reliability than the scale but incorporates views on the importance of economic growth.

Individual Predictors

The WVS contains key sociodemographic variables such as age (years since birth), gender (females code 1), and marital status (married or living together coded 1). Education is measured in two ways. One variable measures the age at which education was completed in 10 categories (from under 12 to 21 and older) and the other measures the highest level attained in eight categories (from inadequately completed elementary education to university or higher education with a degree). About 30 percent of cases are missing data on the age measure and about 23 percent on the degree measure, but only 3 percent are missing data on both. Given a correlation of .75 between the two measures in surveys that ask about

both, completed degree was regressed on age at which education was completed and predicted values were substituted for cases with data missing on completed degree but not on age finished. The imputed measure of completed degree is then used in the analysis.³

For occupation, respondents are divided into those with white-collar jobs (employers, managers, professionals, and office workers) and other jobs. For those with missing data or reporting no occupation, the occupation of the head is used (again, with white collar contrasted to others); those missing data for both the respondent and head are assumed to not have a white-collar occupation. Income measures the self-identified decile within a country, with 1 representing the lowest tenth and 10 the highest tenth.

A short version of the measure of postmaterialism values developed by Inglehart (1977) divides respondents into three categories. Materialists who attribute most importance to maintaining order and fighting rising prices in the nation have a score of one, postmaterialists who attribute most importance to giving people more say in political decisions and protecting freedom of speech have a score of three, and mixed respondents have a score of two.

National Predictors

First, gross domestic product per capita (GDP) based on purchase price parities for each nation-wave comes from the Penn World Table (Heston, Summers, and Aten 2011). This measure of national income, logged to reduce skewness and represent percentage rather than dollar differences, relates to concepts of economic security and objective environmental conditions. Second, the Human Development Index (HDI) from the United Nations (2011) extends the focus on economic product to include measures of life expectancy and literacy. It gives less weight than GDP to oil rich countries with high inequality. Divided by 100, it ranges from 3.61 to 9.44. Third, an objective measure of environmental conditions comes from the Environmental Sustainability Index (ESI), which measures the ability of a nation to protect the environment over the next several decades (Yale Center 2001). Fourth, one ESI component measure focuses on an easily recognized characteristic of the environment – the quality of the air. The measure combines three items on chemical concentration in the air (each weighted by urban concentration of the population) and one item on indoor air pollution from solid fuel use. Unlike the first two measures, however, the two ESI measures cannot be matched precisely to the WVS survey year. Data gathering for the ESI began after waves 2 and 3 of the WHS. The 2001 data are used as an average across all waves, and the measures vary across nations but not time. For both measures, a high score indicates better environmental conditions.

Multilevel Models

The data include information on individuals, nations, and waves. With too few waves to serve as a separate level, the model defines level-1 units as individuals nested within combined level-2 units of nations and waves (with wave included as fixed effects). At level 1, then, environmental concern for individual i in nation/wave j (E_{ij}) is a function of k individual predictors, (X_{kij}):

$$E_{ij} = \beta_{0j} + \sum \beta_{kj} * X_{kij} + r_{ij} \quad (1)$$

In the equation, β_{0j} shows differences across nations and waves in the mean level of environmental concern. The β_{kj} show the effects of the individual predictors for each nation.

³A measure of relative education standardizes values within nations, thus reflecting attainment relative to others within a nation's education system and avoiding comparisons of attainment across diverse national systems.

At level 2, equations treat the level-1 β_{0j} adjusted means and β_{kj} slope coefficients as outcomes and treat nation and waves as the units of analysis. With m national measures (C_{mj}), the level-2 equations take the following form:

$$\beta_{0j} = \gamma_{00} + \sum \gamma_{0m} * C_{mj} + u_{0j} \quad (2a)$$

$$\beta_{kj} = \gamma_{k0} + \sum \gamma_{km} * C_{mj} + u_{kj} \quad (2b)$$

The γ_{km} represent the effects on the slopes (β_{kj}) and are crucial for testing the hypotheses specifying cross-level interactions. The error term in the level-2 intercept equation is assumed to be multivariate normally distributed, with a mean of zero and non-zero variances and covariances. Across the outcomes, the variation within nation/waves is greater than across nations. The intraclass correlation coefficients range from .065 to .118. Estimates come from xtmixed in Stata 11.

Results

Additive Predictors

Table 1 presents descriptive statistics for the standardized environmental concern measures and their individual and national predictors. Because they are available for different waves, the three standardized environmental concern measures differ in the number of cases and countries with valid data. For the country variables, measures of environmental conditions (ESI and Air Quality) have less complete data than those for GDP and HDI.

Table 2 presents the coefficients for the individual-level variables. Generalizing across the three outcome measures, environmental concern appears highest among persons who are young and female and who have high education, white-collar occupations, high income, and postmaterialist values. These results largely confirm previous findings of the positive individual-level associations with SES.

The initial model also includes logged GDP as a predictor. It reduces the willingness-to-pay and tax measures but increases the willingness to accept slower economic growth. When standardized, the coefficients range from .047 to -.106 (listed below the unstandardized coefficients in Table 2). Citizens of richer nations are less willing to pay more (presumably because they already pay more in taxes) and more willing to accept slower economic growth (presumably because they already enjoy a high standard of living). The mixed signs of logged GDP confirm previous findings of negative or inconsistent relationships for the WVS data (Dunlap and York 2008).

Table 2 next lists standardized coefficients for other aggregate measures when replacing logged GDP. Because of close overlap among these variables, each national variable is included one at a time and each coefficient comes from a separate model. The HDI confirms results for logged GDP: It reduces the willingness-to-pay measures but increases the willingness to forego economic growth. The two environmental condition measures have smaller effects but again confirm the pattern: Those in countries with the best conditions are less willing to pay more for the environment but are more willing to accept slower economic growth.

Cross-Level Interactions

To test the hypotheses and move beyond previous studies, Table 3 shifts the focus to the cross-level interactions between the national and individual measures. The table presents only the interaction coefficients, but the models control for all the individual variables and

the additive effects in Table 2. Thus, the first rows list coefficients for the interaction of logged GDP with education, white-collar occupation, and income. The next rows list coefficients for the interactions of HDI, the ESI scale, and the air quality measure.

The results for logged GDP and HDI show consistent support for the interaction hypothesis. Of the 18 interaction coefficients for these two national measures, 15 are positive and significant. A positive coefficient means that SES has stronger influence (or shows greater difference in views) in richer, more developed nations. For example, the coefficient of education by logged GDP for the willingness-to-pay scale shows that the slope of education becomes stronger by .016 for each unit increase in logged GDP (approximately a 172% increase in GDP). At low logged GDP, education has a near zero effect, reflecting similar levels of environmental concern among persons with low and high education levels. At high logged GDP, education has stronger positive effect, reflecting higher levels of environmental concern among persons with high education than low education. SES effects differ across countries more clearly for education and white-collar occupation than for income, however.

A graph can depict these differences across nations. Figure 1 plots predicted willingness-to-pay values by level of education for countries at 1.5 standard deviations below mean logged GDP, at the mean, and 1.5 standard deviations above the mean logged GDP (corresponding to absolute GDP values of \$1,490, \$9,570, \$61,500, values roughly of Burkina Faso, Croatia, and Luxembourg). The education gradient is successively more positive for the nations: .024 for the low GDP nation, .047 for the mean nation, and .070 for the high GDP nation. The three gradients are graphed in the figure. Reflecting the average negative relationship with logged GDP, willingness to pay is highest at low GDP levels. However, education differences are small. At high GDP, environmental concern is lower, while the education gradient is much stronger. This means that less educated individuals have high environmental concern in countries with low income but not in countries with higher income. Highly educated individuals have similar levels of concern across the countries. Logged GDP thus relates most strongly to the environmental views of low SES groups.

The interactions for the environmental conditions are less consistent but suggestive. Of the 18 interaction coefficients, nine are significant and positive. Particularly for education and white-collar occupation, differences in environmental concern are strongest in nations with the best environmental conditions. However, the interactions involving income rarely reach significance or in a few instances have signs in the opposite direction.

To check these results, Table 3 also presents interactions for the individual-level postmaterialism scale. Although postmaterialism does not directly measure SES ($r = .14$ with education), it may overlap enough with affluence and economic security such that evidence of widening differences would lend additional support to the interaction hypotheses. All 12 interactions are positive and significant. Differences in environmental concern between materialists and postmaterialists are largest in richer, more developed nations with better environmental conditions.

Robustness Checks

Thus far, the results show expected effects across three outcome measures, four country-level measures, and three individual measures (education, occupation, and postmaterialism). Only the influence of income fails to vary consistently across countries. Other tests demonstrate additional robustness. Focusing again on education, logged GDP, and the willingness-to-pay scale, significant interactions persist when deleting each of the waves and when deleting the 10 nations with the largest average residuals (results not reported). Further, multiple imputation of missing data on married, education, income, and

postmaterialism raises the sample size from 155,787 to 190,992, but change the results only trivially.

As an additional check on the results, Table 4 examines the effects of education across six regions of the world. If the interactions of education with GDP are meaningful, education coefficients should also vary across regions. For all three outcomes, the results in Table 4 show considerably stronger coefficients for education in Western nations (Western Europe plus the former English colonies of Canada, the United States, Australia, and New Zealand) than in other regions. For the willingness-to-pay scale, the effect of education in Western nations of .073 is more than three times the size of the effect of education in Africa, the Middle East, and South America, and it is more than twice the size of the effect in Asia. It is also larger than the effect in Eastern Europe, although not significantly so. For the other two outcomes, the effects of education in Western nations are statistically larger than in the other regions with one exception (again involving Eastern Europe). Given the higher income and better environmental conditions in the West, these results affirm the statistical interactions in Table 3 and support the hypotheses.

Conclusion

This study began with a question: Does the influence of SES on environmental concern vary meaningfully across nations? The results demonstrate that they do, and new insights for evaluating theories of environmental concern follow. The positive effects of SES increase significantly with national income, human development, and environmental quality. In low- and middle-income nations, SES has weak influence, and support for environmental quality disperses throughout the hierarchy. Indeed, the high willingness to pay for environmental quality appears among all SES groups. These findings support the global environmentalism theory, which points to burgeoning environmentalism across the world. In higher income nations, SES effects are stronger and reveal a positive gradient. These findings support the postmaterialism and affluence theories, which point to high environmental support among high SES groups in rich nations. Each theory receives support when its cross-national domain is specified. Ideally, the results will help to resolve debates that assume only one theory is correct. The complexity of the influence of SES leaves room for theoretical eclecticism.

Support for the hypothesis positing the varied influence of SES shows most clearly for measures of education and occupation. Income offers little support for the hypothesis, perhaps because of the difficulty of obtaining reliable and valid measures across diverse nations. Reporting of income has considerable error even under the best of conditions. Along with education and occupation, postmaterialism similarly shows strong influences with high levels of national income and environmental quality. This finding supports the postmaterialist hypothesis, much as the stronger influences of education and occupation support the affluence theory.

The varied influence of SES across national contexts can be viewed from another perspective. If the influence of SES increases with national income and environmental quality, it implies that changes in environmental concern with national income and environmental quality vary by SES. The results show that willingness-to-pay measures decline with national income and environmental quality, but they do so more for low SES groups than high SES groups. Given their vulnerable position, the views of low SES groups appear to differ more than the views of high SES groups in across nations with diverse economic and environmental conditions.

Although the WVS has advantages over other data sets with its diverse sample of nations and large number of respondents within the nations, it has limitations as well. Measures of SES across diverse nations include considerable error. Additional tests are needed to confirm the interactive results across other sets of nations and with other sets of measures. Similarly, environmental concern encompasses numerous dimensions, and this study examined only those relating to the willingness to pay or sacrifice economic growth. Despite the criticisms of bias in measures based on willingness to pay, they have an advantage. That a measure expected to be biased toward a positive relationship with SES and GDP shows a near zero relationship with SES in low GDP nations and a negative aggregate relationships with GDP provides a stringent test of the global environmentalism theory. That the theory still receives support strengthens the case for environmentalism of the poor in lower-income countries.

Even if preliminary, however, the results suggest a different approach to understanding cross-national patterns of environmentalism. National context needs to be considered as modifying the influence of individual characteristics, not just the level of environmental concern, and theories need to develop this insight with more attention to integrative approaches.

Future research using the approach needs to do something more than compare countries, however. The assumption that low- and middle-income countries will follow the developmental path of high-income countries is obviously untenable, and the analysis here focuses on static differences across countries and waves rather than changes over time within countries. The WVS is not well suited for temporal analysis because most countries did not participate in all waves, and the models here accordingly use time primarily as a control variable. A more rigorous examination of time may come from consecutive cross-sectional survey data for one country such as the General Social Survey for the United States. Analysis of such data may produce quite different findings, as patterns of temporal change in SES determinants of environmental concern need not match patterns of cross-national differences. In the United States, for example, it appears from public opinion polls that a broad consensus of support for environmentalism has emerged (Dunlap 1991; Jones 2010), which implies convergence in views across SES groups (Pampel and Hunter 2012). If so, the moderating influence of SES over time would not match the strong effects of SES found for high-income nations in these cross-national comparisons. Given the potential for divergent outcomes, future research needs to extend cross-national comparisons to include temporal comparisons.

Acknowledgments

This project received funding and administrative support from the University of Colorado Population Center (NICHD R24 HD066613). I thank Raphael Nawrotzki for helpful comments and advice.

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Figure 1.
Slopes Relating Education to the Willingness-to-Pay Scale by Level of GDP

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Outcomes					
Willingness-to-Pay Scale	198794	0	1	-2.63	2.73
Willingness to Pay Taxes	260560	0	1	-1.85	1.57
Protect Environment	188457	0	1	-1.15	0.93
Individual Predictors					
Wave 2	322915	0.19	0.40	0	1
Wave 3	322915	0.24	0.43	0	1
Wave 4	322915	0.31	0.46	0	1
Wave 5	322915	0.25	0.44	0	1
Age	322108	41.44	16.19	18	90
Female	322623	0.51	0.50	0	1
Married	318952	0.65	0.48	0	1
Education	315208	4.34	2.21	1	8
White Collar	322915	0.37	0.48	0	1
Income	283783	4.55	2.41	1	10
Postmaterialism	301236	1.80	0.63	1	3
National Predictors					
GDP	217	14.62	11.12	0.70	59.29
HDI	219	8.02	1.30	3.61	9.68
ESI	189	54.33	12.26	29.83	80.47
Air Quality	189	0.14	0.87	-2.58	1.62

Table 2
Additive Coefficients from Multilevel Models of Environmental Concern Measures

Unstandardized Coefficients	Willingness-to-Pay Scale		Willingness to Pay Tax		Protect Environment	
	b	z	b	z	b	z
Wave 3			-.012	-.021		
Wave 4	-.282	-4.21***	-.218	-3.93***	-.003	-0.06
Wave 5	-.267	-3.83***	-.136	-2.36*	.059	1.29
Age	-.001	-5.89***	-.001	-3.66***	-.001	-6.29***
Female	.012	2.60**	.018	4.15***	.022	4.43***
Married	.024	4.76***	.021	4.59***	.016	2.88**
Education	.044	31.45***	.031	24.87***	.021	15.48***
White Collar	.072	12.74***	.048	9.55***	.041	6.80***
Income	.027	23.82***	.018	17.58***	.008	6.31***
Postmaterialism	.152	38.6***	.112	31.20***	.076	18.09***
ln GDP	-.105	-3.76***	-.113	-5.49***	.048	2.44*
Constant	-.120		-.060		-.374	
Variance Components and Standard Errors						
Level 1	.096	.012	.065	.007	.050	.006
Level 2	.834	.003	.889	.003	.934	.003
N Persons	155787		203419		154150	
N Nation-Years	137		183		135	
Standardized Coefficients ^a	Pay More Scale		Pay More Tax		Protect Environment	
	b	t	b	t	b	t
ln GDP	-.099	-3.76***	-.106	-5.49***	.047	2.44*
HDI	-.088	-3.30***	-.100	-5.15***	.048	2.55*
ESI	-.053	-1.84	-.077	-3.90***	.046	2.21*
Air Quality	-.063	-2.22*	-.070	-3.50***	.006	.30

^aFrom separate equations for each macro-level predictor

100' > d

10' > d
**

50' > d
*

Table 3
Interactive Coefficients for Multilevel Model of Environmental Concern Measures

Interactions	Willingness-to-Pay Scale			Willingness to Pay Tax			Protect Environment		
	b	z		b	z		b	z	
ln GDP x	Education	.017	5.19***	.007	2.88**		.014	6.36***	
	White Collar	.043	4.22***	.018	2.16*		.030	3.36***	
	Income	.011	4.12***	.003	1.13		.004	1.47	
HDI x	Education	.011	4.73***	.005	3.22***		.011	7.49***	
	White Collar	.029	3.99***	.014	2.46*		.026	4.32***	
	Income	.009	4.76***	.003	2.12*		.002	1.18	
ESI x	Education	.003	4.05***	.000	1.48		.001	6.05***	
	White Collar	.003	2.96**	.000	0.57		.002	2.19*	
	Income	.000	.59	.000	-2.72**		.000	.80	
Air Quality x	Education	.012	3.21**	.009	3.18**		.011	3.67***	
	White Collar	.040	3.36**	.027	2.77**		.018	1.63	
	Income	.003	.99	-.002	-.93		.005	1.57	
ln GDP x	Postmaterialism	.045	5.55***	.034	5.29***		.053	8.97***	
HDI x	Postmaterialism	.029	5.06***	.025	5.54***		.033	7.65***	
ESI x	Postmaterialism	.003	4.68***	.003	5.00***		.004	***	
Air Quality x	Postmaterialism	.035	3.80***	.028	3.88***		.039	4.99***	

*
p < .05

**
p < .01

p < .001

Table 4
Region-Specific Coefficients for Education from Multilevel Models of Environmental Concern Measures

Outcome	Education Coefficient by Region					
	Africa	East	Middle Asia	South America	Eastern Europe	Western Nations
Willingness-to-Pay Scale	.022***	.020***	.035***	.020***	.059	.073
Willingness to Pay Tax	.018***	.021*	.031*	.001***	.042	.046
Protect Environment	.009***	-.004***	.023***	.028**	.026***	.051

Test of difference between each region and Western Nations:

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