Environmental Attitudes in International Comparison: An Analysis of the ISSP Surveys 1993 and 2000*

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Objective. The goal of this article is to compare the concern for the natural environment between the citizens of 26 countries that participated in the 2000 International Social Survey Program (ISSP) and to explain the differences. Prior studies (e.g., Dunlap, Gallup, and Gallup, 1993; Brechin, 1999) suggest that the increase of environmental concern is a global phenomenon. However, Inglehart (1995), as well as Diekmann and Franzen (1999), argue that the level of environmental concern and knowledge is highly correlated with GNP per capita. *Method.* The article analyzes new evidence obtained from the ISSP 2000 and compares it to the prior findings based on the ISSP 1993. *Results.* It is shown that citizens in wealthier nations express greater concern for the global condition of the environment than those in poorer countries. *Conclusion.* The new analysis of the ISSP 2000 confirms our original notion that support for global environmental protection is strongly correlated with wealth. However, the increase in real GDP between 1993 and 2000 did not lead to a further increase in environmental concern.

The level of concern for the natural environment has increased globally since the 1950s. The increasing concern is demonstrated by the rise in international environmental treaties, the number of national environmental ministries, and the rise of international nongovernmental organizations (Frank, Hironaka, and Schofer, 2000; Frank, 1997). Other evidence stems from survey research, particularly from the Health of the Planet Survey (HOP), the World Values Survey (WVS), and the International Social Survey Program (ISSP). All three surveys present abundant evidence on the global increase of environmental concern. However, the various studies using these data sources offer different explanations and conclusions about the causes of the international increase in concern for environmental protection.

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Inglehart (1995, 1997) argues that the rise in concern is due to two different processes, depending on a country's affluence. Rich countries, he argues, have a larger proportion of postmaterialists who give less priority to economic issues and greater attention to other values, the concern for protecting the natural environment among them. Poor nations, on the other hand, face pressing environmental problems such as water or air pollution and those problems cause increasing support for the local environment. Inglehart (1995) supports his argument with an analysis of 43 countries that participated in the World Values Survey. Greatest support for environmental protection can be observed in countries with high gross national product (GNP) per capita, such as Sweden, Denmark, or the Netherlands. However, support is also high in poorer nations that face significant environmental problems such as Russia, Turkey, or the Czech Republic.

Inglehart's "objective problem and subjective value" hypothesis has been criticized in a series of articles by Dunlap, Gallup, and Gallup (1993), Dunlap and Mertig (1995, 1996, 1997), Brechin and Kempton (1994), and Brechin (1999).[1] Particularly, Dunlap, Gallup, and Gallup (1993) present evidence from 24 countries that participated in the HOP Survey. Most items (9 out of 14) in the HOP that measure environmental concern are negatively correlated with a nation's GNP per capita. Consequently, Dunlap and Mertig (1997) conclude that environmentalism is a global phenomenon and in many instances negatively related to GNP per capita. Hence, they conclude that postmaterialism or affluence is not a prerequisite for support for environmental protection.

However, Dunlap and Mertig's conclusions were criticized on various grounds in a paper by Diekmann and Franzen (1999). First, measuring environmental attitudes is a delicate issue. Particularly, a closer look at the wording of the questions suggests that concern for the environment cannot be conceived to be one dimensional. The HOP survey contains 14 different items. All items that refer to participants' perceptions of the importance of the quality of their local environment or that are related to health issues are negatively correlated with GNP per capita. Those items, however, that express willingness to pay higher prices in order to protect the environment or that are related to the perceived importance of the environment as compared to other national problems show a positive correlation with GNP per capita. The HOP survey also contained an open question in which respondents had to name the most important problem in their nation. This question required respondents to *rank* the importance of the environment in relation to other problems versus *rating* the seriousness of all kinds of problems simultaneously. Reanalysis of the results obtained by the ranking procedure shows a positive correlation (Spearman rank correlation) with GNP per capita of 0.35, which is significant on a 5 percent level for a

[1]See also the discussion in Vol. 78 of *Social Science Quarterly* by Kidd and Lee (1997), Brechin and Kempton (1997), Abramson (1997), and Dunlap and Mertig (1997).

one-tailed test. Thus, inhabitants in more affluent nations are more likely to rank environmental problems first.

Second, Diekmann and Franzen (1999) analyzed the 1993 ISSP survey that dealt with environmental concerns. Inspection of the 11 items contained in the ISSP to measure environmental concern reveals that they refer much more to "willingness to pay" questions or to "priority for environment versus the economy" questions. In line with our reinterpretation of the HOP data, analysis of the ISSP data strongly supports the affluence hypothesis: the correlation between GNP per capita and an index of priority for the environment (or global environmental concern) is 0.84. Thus, from the evidence presented so far, it cannot be concluded that the affluence hypothesis can be dismissed. Standard economic reasoning suggests that the protection of the environment is not only a public good, but also a normal good, whose demand increases with income. Citizens in wealthier nations not only have a higher demand for a clean environment, but they also have less pressing economic problems and are therefore more willing and able to reduce their standard of living in order to devote more resources to global environmental protection. However, concern for local environmental problems is higher in poorer nations because of the more severe local environmental problems.

In this article I analyze the new data from the ISSP 2000, which was again conducted on environmental concern. The new analysis of the 2000 survey and the comparison with the results obtained from the ISSP in 1993 allows submitting the affluence hypothesis to another test. The next section describes the data and presents the results of the analysis of the ISSP 2000. The last section summarizes, concludes, and discusses the findings.

Results from the ISSP 2000

In 1993, 21 countries participated in the ISSP. In 2000 that number had increased to 32. However, in autumn 2002 data from only 26 countries was available from the official data archives. The countries that participated and provided the data are listed in Table 1.

Unfortunately, some data from countries that participated in 1993 (Italy, Poland, and Hungary) is also still missing and therefore cannot be taken into account for comparison purposes. However, the available data show similar variance to the ISSP 1993 with respect to GDP per capita and environmental concern.[2] The richest country with respect to the purchasing power parity (PPP) is the United States with US$34,300 per capita followed by Norway (US$29,800) and Japan (US$26,500). The poorest nation is

[2]In this article, the GDP and the purchasing power parity (PPP) per capita are used as indicators of wealth. Former studies often used the GNP. Thus, if we refer to results of former studies we report their findings with respect to the wealth indicator they used, for example, GNP.

TABLE 1

Participating Nations of the ISSP 2000, Mean Environmental Concern, and the GDP per Capita

Country	Country Code	Mean of Environmental Concern ISSP 2000; Index of 8 Items[a]	Sample Size[b]	GDP[c] in $1,000 per Capita in 2000	PPP[d] in $1,000 per Capita in 2000
Japan	J	27.4	823	38.2	26.5
Finland	FIN	27.3	1110	23.5	24.6
Switzerland	CH	27.1	649	33.4	25.0
Canada	CDN	26.5	1115	22.4	27.3
Sweden	S	26.3	813	25.6	23.8
Netherlands	NL	26.2	1319	22.9	26.2
Austria	A	26.2	1011	23.3	26.3
Norway	N	26.1	1151	36.0	29.8
New Zealand	NZ	26.0	948	13.0	18.8
Ireland	IRL	25.5	1232	24.7	25.5
Spain	E	25.4	673	14.2	19.2
United States	USA	25.1	973	34.9	34.3
Great Britain	GB	25.0	788	23.7	23.6
Germany	D	24.8	1140	22.8	25.0
Slovenia	SLO	24.8	1077	9.1	17.4
Bangladesh	BD	24.3	783	0.4	1.7
Israel	IL	23.8	1119	17.7	19.3
Mexico	MEX	23.6	1262	5.9	8.8
Northern Ireland	NIRL	23.2	515	—	—
Czech Republic	CZ	22.9	1015	4.9	13.6
Russia	RUS	22.6	1005	1.7	8.0
Chile	CL	22.4	1275	4.6	9.1
Philippines	RP	21.9	1087	1.0	4.2
Latvia	LV	21.8	1000	3.0	7.0
Portugal	P	20.7	750	10.5	16.9
Bulgaria	BG	20.4	594	1.5	5.5
Mean		24.5		16.8	18.7
Total sample size			25227		

[a]The index for environmental concern ranges from 8 to 40.

[b]Reported are only the valid cases.

GDP = gross domestic product (in U.S. dollars); source: ⟨www.worldbank.org⟩.
PPP = purchasing power parity (in international dollars); source: ⟨www.worldbank.org⟩.

Bangladesh with a PPP of US$1,700 per capita. Table 1 also contains the average value from a scale of eight items that measure global environmental awareness. This scale ranges from 8 to 40. Higher means indicate higher levels of environmental concern and countries are ranked in Table 1 according to their mean values. Therefore, Japan, Finland, and Switzerland rank at the top with respect to environmental concern as measured by this scale in 2000. The complete list of items that were administered to

TABLE 2

Items of Environmental Concern, Percentage Agreement, and Comparison Between OECD and Non-OECD Countries

	% Agreement/Disagreement		
	All Countries	OECD Countries	Non-OECD
Modern science will solve our environmental problems with little change to our way of life.[b] (disagreement)	47 (0.66**)[a]	53	33
We worry too much about the future of the environment and not enough about prices and jobs today.[b] (disagreement)	45 (0.60**)	47	40
People worry too much about human progress harming the environment.[b] (disagreement)	45 (0.54*)	48	38
Economic growth always harms the environment. (agreement)	32 (−0.38)	30	37
Almost everything we do in modern life harms the environment. (agreement)	51 (−0.36)	51	52
In order to protect the environment Switzerland (country) needs economic growth.[b] (disagreement)	23 (0.68**)	27	12
How willing would you be to pay much higher prices in order to protect the environment?[b] (agreement)	40 (0.24)	39	41
How willing would you be to pay much higher taxes in order to protect the environment? (agreement)	28 (−0.09)	26	33
How willing would you be to accept cuts in your standard of living in order to protect the environment?[b] (agreement)	35 (0.18)	35	33
It is just too difficult for someone like me to do much about the environment.[b] (disagreement)	49 (0.75**)	55	35
I do what is right for the environment, even when it costs more money or takes more time.[b] (agreement)	51 (0.27)	54	45

[a]Numbers in brackets denote the Spearman rank correlation coefficient with gross domestic product (GDP) per capita 2000.

[b]Items were added to an index that has a Cronbach's alpha coefficient of 0.84.

* = significant at the 10 percent level; ** = significant at the 5 percent level.

SOURCE: International Social Survey Program (ISSP) (2000).

respondents in the ISSP to measure environmental concern is shown in Table 2.

The second column of Table 2 shows the average percent of agreement (agree or strongly agree) or disagreement (disagree or strongly disagree) with a statement and the Spearman rank correlation of that item with GDP per

capita.[3] The third and fourth columns display the average percent of agreement or disagreement for OECD and non-OECD countries. Thus, a higher proportion of citizens in OECD nations (53 percent) disagree with the statement that "modern science will solve our environmental problems with little change to our way of life" as compared to non-OECD countries. The same is true for the second statement. A higher proportion of individuals in the wealthier nations (47 percent) disagree with the statement that "we worry too much about the future of the environment and not enough about prices and jobs today." Both items have positive Spearman rank correlations with the countries' GDP per capita, indicating that respondents in the wealthier nations disagreed more often with the statements than those in poorer nations. Table 2 also contains three willingness to pay items. Two of these items are positively correlated with GDP per capita (although not significantly) and one is slightly negative. In the ISSP 1993 all three of these items were significantly positively correlated with GNP per capita. One possible explanation for this change could be that some industrial countries have introduced ecological taxes since 1993 (e.g., Germany), which might reduce respondents' willingness to have further tax increases.[4] Overall, inspection of Table 2 reveals that 8 out of the 11 statements are positively related to GDP (five of those correlations are significant), indicating that respondents in the wealthier countries gave more pro-environmental answers to most items than respondents in poorer nations. Only three items are negatively correlated to GDP, indicating that respondents in poorer nations gave more pro-environmental answers with respect to these three items. However, none of the negative correlations are significant.[5]

Eight of the 11 items were selected (the ones marked with a "b") on the basis of their interitem correlation and summed up for a scale of global environmental awareness. The mean of this scale for each country is shown in Table 1.[6] Correlating this additive index with GDP per capita produces a highly positive correlation of 0.79 ($p < 0.00$).[7] Thus, results from the ISSP 2000 survey replicate the former finding obtained with the ISSP 1993: citizens in richer countries report higher levels of global environmental concern as measured in the ISSP than citizens in poorer nations. This result

[3]Note that items are differently phrased. Whether agreement or disagreement indicates pro-environmental attitudes depends on the statement and is indicated in parentheses following the statement in Table 2.

[4]This interpretation has also been put forward by Kidd and Lee (1997), whose reanalysis of the World Values Survey results in similar findings.

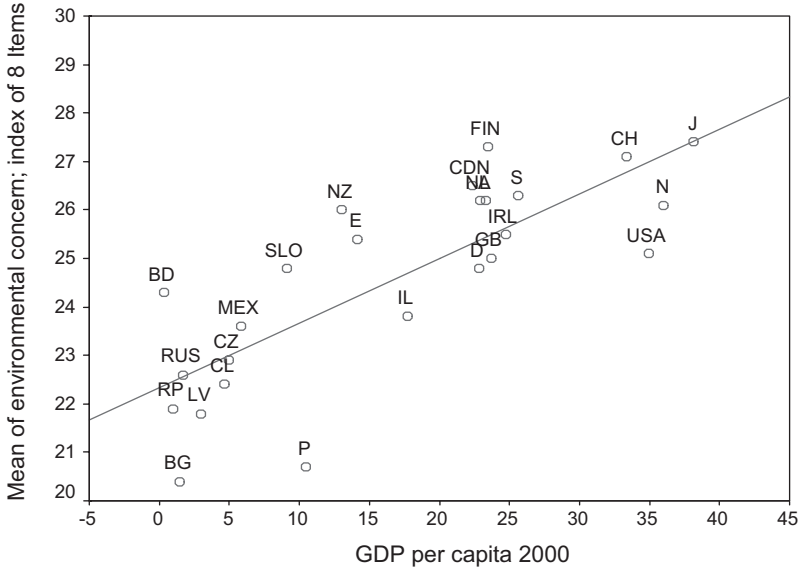
[5]A more detailed discussion on the measurement of environmental concern in the ISSP is contained in Diekmann and Franzen (1999).

[6]On the aggregate level, where the number of cases are the 26 countries, the index reaches a Cronbach's α value of 0.84. However, Cronbach's α varies strongly on the individual level from country to country.

[7]Using the Spearman rank correlation instead of the Pearson's correlation results in $r = 0.80$ (see Table A1 in the Appendix).

FIGURE 1

The Correlation of Environmental Concern with GDP per Capita for 25 Countries of the ISSP 2000 ($r = 0.79$)



is graphically demonstrated in Figure 1, which also shows that the relation is basically linear.[8]

One might wonder whether the results obtained depend on the selection of eight items out of the 11 items. However, this is not the case. The correlation between an additive index of all items contained in Table 2 (range from 11 to 55) with GDP per capita results in a Pearson's correlation of 0.72 ($p < 0.00$). It may also be argued that the purchasing power parity (PPP) per capita is a better indicator of wealth than the GDP per capita. However, using the PPP per capita instead of GDP per capita results in an almost identical Pearson's correlation of 0.76.[9] Thus, to ease comparison with former analysis (Diekmann and Franzen, 1999) I stick to the index of the eight selected items.

Finally, I compare the environmental concern of the ISSP 1993 participants with the results seven years later. The 18 countries for which such a comparison is possible are displayed in Table 3. As can be seen, the average environmental concern decreased a little in most of the 18 countries,

[8]A test of linearity can be conducted by regressing the GDP per capita together with the square of GDP on environmental concern. This squared expression is not significantly related to environmental concern, indicating that the relationship is basically linear.

[9]We also calculated the correlation of the log of GDP and PPP per capita. None of these transformations changed our results.

TABLE 3

Comparison of 1993 Participants to 2000 Participants

Ranking by the Index of Environmental Concern ISSP 1993	Differences in Environmental Concern	Ranking by the Index of Environmental Concern ISSP 2000	Differences in GDP in $1,000 per Capita	Percentage Difference of Real GDP (1993 to 1999)
Switzerland	−1.6	Japan	4.4	7.2
Canada	−1.1	Switzerland	0.7	3.4
Netherlands	−1.3	Canada	5.8	11.6
Norway	−1.0	Netherlands	2.7	17.3
Japan	+0.4	Norway	11.9	20.5
New Zealand	−0.9	New Zealand	0.5	13.0
Germany	−1.0	Ireland	12.4	56.6
United States	−0.6	Spain	2.1	18.7
Great Britain	−0.2	United States	10.6	18.6
Spain	+0.6	Great Britain	9.6	17.2
Israel	−0.9	Germany	0.0	8.4
Northern Ireland	−1.4	Slovenia	3.7	27.7
Slovenia	+0.2	Israel	4.3	14.5
Ireland	+1.9	Northern Ireland	—	—
Russia	−0.5	Czech Republic	1.8	9.5
Czech Republic	−0.1	Russia	−0.5	−18.5
Philippines	−0.2	Philippines	0.2	9.6
Bulgaria	−0.7	Bulgaria	0.3	−0.7
Mean	−0.5		4.1	13.8

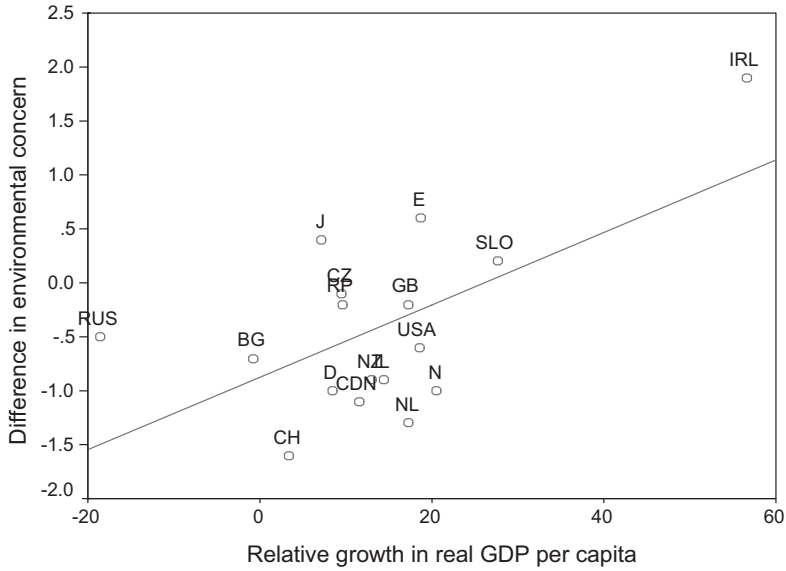
on average by 0.5 points on the scale of eight items.[10] Increases can be observed only for Japan, Spain, Slovenia, and Ireland. Also, a country's rank position with respect to environmental concern did not change much. Thus, for example, Switzerland, Canada, and the Netherlands can still be found among the top ranks while Russia, the Philippines, and Bulgaria are still at the bottom. At the same time, wealth as measured by real GDP per capita increased in almost all countries (the exception is Russia), on average by 13.8 percent between 1993 and 1999.[11] Some countries experienced a dramatic increase in real GDP per capita, for example, Ireland by 56.6 percent and Slovenia by 27.7 percent. If the affluence hypothesis holds, those countries that experienced a relative strong increase in wealth should also show an increase in environmental concern. In fact, a few countries conform very well to this expectation, for example, Ireland, Spain, and Slovenia. Also, the

[10]Note that environmental concern is measured (at best) on an interval scale so that it makes no sense to calculate relative changes of environmental concern.

[11]Data on real GDP per capita can be found at the Groningen Growth & Development Center, Faculty of Economics, University of Groningen, Netherlands <http://www.eco.rug.nl/ggdc>. However, real GDP per capita is only available up until 1999.

FIGURE 2

Relative Change in Real GDP per Capita and Change of Environmental Concern for 1993 and 2000 ($r = 0.60$)



Pearson correlation between the relative change in real GDP per capita with the change in environmental concern is positive ($r = 0.60$) and highly significant.

However, this result needs two qualifications. First, the correlation is substantially due to one case, namely, Ireland. The correlation drops to 0.17 and is no longer significant with the exclusion of Ireland. Second, the correlation stems mainly from the fact that most countries with larger increases in GDP experienced lower decreases in environmental concern than countries with lower economic growth. In other words, environmental concern remained more stable in nations with larger economic growth. The relation between growth and environmental concern is depicted in Figure 2.[12]

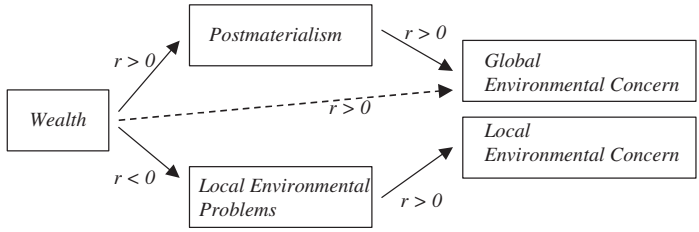
Conclusions

Analysis of the ISSP 2000 confirms former results of the analysis of the ISSP 1993 (Diekmann and Franzen, 1999). Cross-sectional analysis of the

[12]The relation between growth and the change in environmental concern is actually U shaped. However, this is created by two cases, Russia and Ireland, and should therefore not be overinterpreted. I also ran multivariate regression models to test whether the level of environmental concern in 1993 has an influence on the change in environmental concern in addition to the relative change of real GDP per capita. This is the case: countries with high levels of environmental concern in 1993 are more likely to have lower values of environmental concern in 2000.

FIGURE 3

Explanations of Environmental Concern by Postmaterialism and the Affluence Hypothesis (dotted line)



ISSP 1993 as well as of the ISSP 2000 suggests that higher proportions of citizens in wealthier nations prefer general environmental protection to economic growth than citizens in poorer countries. This does not mean that individuals in poorer nations are less concerned with the quality of their local environment, as is demonstrated by Dunlap and Mertig (1996) or Brechin (1999). These people have more pressing ecological problems and are also more concerned about them. In this way, Inglehart's thesis that environmentalism is driven by "objective problems and subjective values" is in line with the results of the ISSP 1993 and 2000. However, this does not necessarily imply that pro-environmental attitudes are driven by "post-materialism" as asserted by Inglehart (1995, 1997). Inglehart believes that pro-environmental attitudes are a result of a basic value change that stems from socialization in developed nations. In contrast, the standard "affluence hypothesis" states that pro-environmental attitudes are directly affected by wealth as indicated by the dotted line in Figure 3. An increase in wealth has two effects: it increases the demand for a clean environment and it eases the reallocation of resources toward more environmental protection. Thus, people could remain materialists in all other issues, but still favor more environmental protection. However, the difference between the affluence hypothesis and the explanations via postmaterialism is small, as demonstrated in Figure 3.

Both hypotheses predict the same longitudinal effect. Support for environmental protection should decrease in countries that experienced an economic decline, and should increase in those that experienced economic prosperity, at least in the long run. Unfortunately, our data is not conclusive with respect to this longitudinal hypothesis. Comparison of the 17 countries that participated in the ISSP 1993 and 2000 reveals that real GDP per capita rose on average by 13.8 percent from 1993 to 1999, while the average support for environmental protection basically remained unchanged (it decreased by 0.5 units).[13] The correlation between the relative change in real

[13]One of the 18 countries had to be excluded due to missing data.

GDP and the change in environmental concern is positive ($r = 0.60$), but this correlation is mostly due to the fact that countries with higher economic growth had, on average, comparable lower decreases in environmental attitudes than countries with lower economic growth. Thus, it seems that economic growth is a prerequisite for the maintenance of the level of environmental concern that was reached in 1993. However, neither hypothesis can be dismissed on the basis of the findings presented. First of all, the analysis is based on a small number of nations and the ISSP participants are, of course, not a random sample of all existing nations. So generalization cannot be undertaken here. Second, according to the postmaterialism hypothesis, a change of basic attitudes and values in a population does not occur within a generation, but between generations. Thus, as a new generation grows up the change should only slowly become visible in aggregate data. A period of seven years might not be long enough to detect such a long-term process. In comparison, the affluence hypothesis assumes that individuals' demand for environmental quality rises directly as wealth increases. Such a shift in demand should occur within all generations and should appear more instantaneously than a generational shift. Thus, the results of this analysis tend to favor the postmaterialism hypothesis over the affluence model.

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APPENDIX

TABLE A1

Summary of Correlation Analysis

	Pearson Correlation	Spearman Rank Correlation
GDP 2000 with the Index of Environmental Concern of 8 items	0.79** (0.00)	0.80** (0.00)
GDP 2000 with the Index of Environmental Concern of 11 items	0.72** (0.00)	0.65** (0.00)
Log of GDP 2000 with the Index of Environmental Concern of 8 items	0.71** (0.00)	0.80** (0.00)
PPP 2000 with the Index of Environmental Concern of 8 items	0.76** (0.00)	0.78** (0.00)
PPP 2000 with the Index of Environmental Concern of 11 items	0.66** (0.00)	0.64** (0.00)
Log of PPP 2000 with the Index of Environmental Concern of 8 items	0.65** (0.00)	0.78** (0.00)
Log of PPP 2000 with the Index of Environmental Concern of 11 items	0.54** (0.01)	0.64** (0.00)
Difference of environmental concern with percentage difference of GDP	0.57** (0.02)	0.40 (0.11)
Difference of environmental concern with percentage difference of real GDP p.C.	0.60** (0.01)	0.28 (0.28)

** = significant at the 1 percent level; * = significant at the 5 percent level. Numbers in brackets denote the exact significance level of a correlation.