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Teaching and learning: Achieving quality for all

Education and attitudes towards the environment

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Education and attitudes towards the environment

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The research question

In this report, we will seek to gain a current and detailed understanding of the relationship between levels of education and levels of environmental concern at an international level. The question of which factors predict levels of environmental concern has been examined in the past, with relative income being shown to predict levels of environmental concern when a range of other individual and country-level characteristics are controlled for (Franzen and Meyer, 2009). In addition to updating this analysis, which was undertaken using data from 1993 and 2000, we build upon its approach in a number of ways, in order to extend the evidence base in relation to this question.

First, rather than devising a single measure of environmental concern, we consider a range of measures of this phenomenon, in order to understand the relationship of levels of education with each individually. This will enable us to consider whether the relationship between levels of education and environmental concern is consistent across all expressions and manifestations of the latter phenomenon. While there is an extensive literature which argues that environmental concern is a latent attitude, which cannot be measured or summarised completely by one particular question, approaching the subject in this way will enable us to further understand why levels of education might make a particular contribution to levels of environmental concern, by allowing us to identify which specific aspects they have the strongest links with. At the start of this report, we therefore briefly review the potential ways in which environmental concern can be measured and identify a set of measures on which the subsequent analysis will focus.

In addition to examining the relationship between levels of education and environmental concern, the second substantive section of the chapter will examine if, how and where this relationship is changing over time. Inevitably, the distribution of levels of education varies substantially between and is continually changing within individual countries; if particular levels of education have a particular impact on concern about the environment, we might expect levels of concern to change over time, along with the changing distribution of education levels within a country.

Methodology

a) The data

To explore these issues, analysis was undertaken of data collected as part of the International Social Survey Program (ISSP) – an annual cross-national survey of public attitudes to a range of social and moral issues [1]. Specifically, analysis was undertaken of data collected in 1993, 2000 and 2010, which focussed on measuring attitudes, perceptions, knowledge and behaviour in relation to the environment. At each point in time, samples of randomly selected individuals in the countries participating in the Programme completed a centrally developed questionnaire instrument, measuring their attitudes, perceptions and behaviour in relation to the environment as well as a range of generic and country-specific socio-demographic measures.

b) The sample

As participation in ISSP is voluntary, participating countries cannot be viewed as a randomly selected sample of all countries, meaning that the conclusions we draw cannot be

extrapolated to all countries throughout the world. For this reason, we focus on identifying the relationship between levels of education and environmental concern for the range of countries for which data is available, seeking to draw out patterns relating to different “types” of countries in terms of levels of development, economy and region. While it is arguable that our findings in relation to particular ‘types’ of countries can be extrapolated to other countries of that type, the conclusions we draw for the sample of countries participated in ISSP cannot necessarily be extrapolated to all countries per se.

c) The outcome measures

In the next section, we review the various approaches to measuring environmental concern utilised in the ISSP questionnaire and elsewhere and detail the three measures that were selected for the subsequent analysis. From two of these measures, binary measures of environmental concern were devised, necessitating the use of logistic regression models; for the third, an ordinal measure of environmental concern (in the form of environmental action) was developed; this was subsequently analysed using a linear regression model.

d) Explanatory variables

There is a substantive literature exploring the factors that relate to and influence an individual’s level of environmental concern. Individual factors which have been shown to link with and predict levels of environmental concern are age, sex and income, in addition to an individual’s level of education. To identify the distinct relationship of levels of education with environmental concern, we therefore include these characteristics, where possible, in our models, so as to account for any correlation between education and environmental concern resulting from the correlation between levels of education and such individual factors. While data on age and sex were collected as standard in all ISSP countries, data on income was collected using a country-level derivation.

Levels of education were measured by the ISSP questionnaire in a variety of ways. Respondents were asked to identify their level of education, using an individualised categorisation that was relevant to their particular country. From this data, a standardized measure of education level was obtained. Respondents were also asked to identify the number of years of education which they had received. The standardized measure of level of education was selected for our models, so that the impact of broadly comparable levels of education across different countries could be compared. As different countries will have developed varying requirements and common practices in relation to education, the six existing categories in this measure were combined into three to include in the regression models, as detailed below.

Table 1 Variables measuring levels of education

Standardized level of education measured in ISSP 2010 questionnaire	Dependent variable included in model
No formal qualification	No / lowest qualification
Lowest formal qualification	
Intermediate secondary completed	Secondary qualification
Higher secondary completed	
University degree incomplete	Degree level or above
University degree completed	

In addition to a range of socio-demographic characteristics, it has also been demonstrated that environmental knowledge is associated with levels of environmental concern, although

the causal nature of this relationship can be debated (for instance, it may be that a detailed knowledge of environmental issues generates environmental concern or that existing concern in this area prompts the individual to obtain a good knowledge of this issue). As our interest was in identifying the relationship between levels of education per se and environmental concern, we sought to extract environment-specific knowledge, so as to identify its role in shaping attitudes separately. The ISSP questionnaire in 2010 contained two sets of questions that were used to derive measures of environmental knowledge. The first consisted of two questions measuring the extent to which the individual assessed their knowledge of “the causes of environmental problems” and “the solutions to environmental problems” (with the response options comprising a 5-point scale ranging from “Know nothing at all” to “Know a great deal” in both instances). The second set of questions constitute “objective” measures of environmental concern – with respondents being asked to respond to two true-false statements (that climate change is caused by a hole in the atmosphere and that climate change is caused by the use of coal, oil or gas). From these data, a combined measure of actual knowledge was derived (with no correct answers being defined as “poor”, one correct answer being defined as “intermediate” and two correct answers being defined as “good”). While two measures of environmental knowledge could potentially be unnecessary (particularly if they are measuring the same phenomenon), our initial analysis suggested that this was not the case, with the two derived measures being fairly weakly correlated with one another. In other words, it was often not the case that those who reported a good knowledge of environmental issues demonstrated this in practice.

e) Approach to the inclusion of variables in the regression models

Due to the evolving nature of the International Social Survey Programme, in terms of both country membership and standardized questionnaire measures, not all variables of interest detailed above were fielded in all countries at each of the three data collection points examined in this chapter. Specifically, objectively-measured environmental knowledge was an optional item in 2010, while self-assessed environmental knowledge was an optional item in earlier years. Given the primary interest in understanding the different relationships between levels of education and environmental concern across a range of countries, we adopted a two-pronged approach to address this issue. For each measure of environmental concern, we first produced models for all countries using universally available measures. Subsequently, we produced models for restricted samples of countries, for which additional data were available. We were able to infer, from these more limited models, how they might change the roles of different variables in the “all country” models – by examining how the explanatory power of variables for those countries present in all models changed.

Before turning to consider these models, we first examine the selection of the outcome measures of environmental concern.

Measuring and exploring environmental concern

Prior to creating the regression models, initial analysis was undertaken to select and explore the different outcome measures to be used as the key outcome variables measuring environmental concern.

An individual’s concern about the environment, as with most social policy spheres, can potentially express itself in a wide variety of ways. Reported levels of concern about a particular issue, such as the environment, can be measured when that issue is considered in isolation or when the individual is asked to prioritise their concern about this issue, in relation to a range of other possible areas of concern. In addition, concern about the environment may manifest itself in environmental action, although the relationship between attitudes and behaviour in such areas is known to be complex; environmental action will inevitably be

mediated by the accessibility, feasibility and acceptability of various forms of action, within an individual's daily life and country of residence.

It has frequently been argued that environmental concern should be viewed and measured as a latent attitude, with variables being constructed from a range of different measures to capture it analytically, using approaches such as factor analysis and latent class modelling. However, as our interest is in exploring how attitudes to education influence different 'types' of environmental concern, the subsequent analysis focusses on three selected measures from the ISSP survey, which we feel encapsulate the range of approaches to measuring this phenomenon, described above. Specifically we focus on:

- **'Absolute' environmental concern** – we regard this as being an individual's expressed concern when asked about the environment in isolation. Inevitably, an individual may sub-consciously consider a range of other concerns when defining the extent to which they are concerned about the environment, but in such questionnaire items they are not invited to do so explicitly. The ISSP questionnaire in 2010 included one item which utilised this approach; specifically, respondents were asked "Generally speaking, how concerned are you about environmental issues?" – and were provided with a 5-point answer scale from which to select their answers (ranging from "not at all concerned" to "very concerned"). For the subsequent analysis, we created a binary measure of absolute environmental concern, with those who stated that they were "very concerned" or "fairly concerned" being classified as expressing environmental concern.
- **'Comparative' environmental concern** – this refers to measures where concern can be expressed about the environment, when the individual is explicitly asked to prioritise a range of different areas of potential concern including the environment. The ISSP questionnaire included a range of questions which measured environmental concern in this way. We selected an agree-disagree item "We worry too much about the future of the environment and not enough about jobs and prices today" – in order to analyse this aspect of environmental concern. In this measure, respondents are being asked to prioritise between their long-term concerns about the environment and more immediate economic concerns. For the subsequent analysis, we created a binary variable, with those who disagreed with this statement ("disagree" or "strongly disagree") being classified as expressing comparative environmental concern.
- **Environmental action** – while action in relation to the environment will be prompted by a range of factors in addition to environmental concern (including the acceptability and accessibility of various forms of action), it is nevertheless of interest whether education levels exert a similar or different impact on environmental action, as they do on expressed levels of concern. The ISSP questionnaire included a range of questions about environmental action, including items about environmental behaviour and activities in the respondent's day-to-day life. We selected a questionnaire item which asked respondents whether, in the last five years, they had signed a petition, given money or taken part in a protest or demonstration, in relation to the environment. While this question was designed to capture a range of environmental activities, it also enabled the construction of an ordinal measure, identifying the number of environmental activities respondents had taken part in in the last five years (0, 1, 2 or 3). Because of this, it enabled us to capture the "extent", as well as the actual occurrence of, activities of this type for particular individuals. Thus, this measure was treated as an ordinal outcome variable in the models that were developed.

Prior to running regression models for these three different measures of environmental concern, bivariate analysis was undertaken for a small selection of countries representing diversity in terms of region, wealth and environmental performance. The intention of this

analysis was to highlight some broad patterns which it was intended the subsequent multivariate analysis would shed light upon. Analysis was undertaken for Great Britain, the United States, Russia, Japan and the Philippines

From these country-level analyses, we can draw a number of tentative conclusions about the bivariate relationship between education levels and levels of environmental concern in a range of countries, and between the different measures themselves:

- Unsurprisingly, absolute environmental concern was the most common type of concern expressed in each of the five countries; this is what we would expect theoretically, as respondents are not being asked to balance their concern about the environment with other concerns or priorities (and are thus likely to consider them). While absolute concern was significantly related to levels of education in three of the five countries (with higher levels of education being associated with greater absolute concern), this relationship (in terms of the magnitude of the differences observed) was the least pronounced of the three measures of concern examined.
- Comparative environmental concern increases most dramatically with levels of education, in all countries examined with the exception of the Philippines. We might suspect that those who have higher levels of education (who are also likely to have higher incomes) would be less likely to be immediately concerned by jobs and prices, within their own day to day lives. Multivariate analysis is therefore needed to ascertain whether levels of education predict comparative environmental concern, or are merely associated with it (due to their association with levels of income).
- Reported environmental action was relatively rare in all five countries, but increased substantially with levels of education in all five countries, with the exception of Japan. It appears to be far more common in those countries which are economically better-off; this may be because those in richer countries are more likely to have a higher level of education, a hypothesis which we can consider when examining the results of the regression models, to ascertain the impact on levels of concern of different levels of education in different countries.

Having considered the prevalence of the different measures of environmental concern and their varied bivariate relationships with levels of education, we next turn to examine the results of the regression models, in order to assess whether education levels make an independent contribution to the different levels of concern in various countries, which other factors are important, and whether these relationships are changing over time.

What is the current relationship between levels of education and environmental concern?

In the tables below, we present the results of two different regression models for individual countries, for each of the three measures of environmental concern discussed above. The first model, in each case, includes socio-demographic measures available for all countries that participated in ISSP – age, sex, income (defined at the country-level) and levels of education. The second models additionally include measures of environmental knowledge – self-assessed environmental knowledge, available for all countries in 2010, and a constructed measure of objectively-assessed environmental knowledge, where available (the two items required to construct this measure were optional items in 2010). By comparing the results of the two models, we can ascertain whether levels of education are linked with levels of environmental concern and whether those relationships identified persist when specific environmental knowledge is accounted for. In other words, the second set of models allow us to identify the relationship between generic levels of education and environmental concern, excluding the environment-specific knowledge that might be acquired through participation in formal education.

a) Summary of results

In the table below, we summarise the results of the three sets of models run to identify the relationship between levels of education and various measures of environmental concern in 2010. These findings indicate that levels of education frequently link with levels of environmental concern in individual countries, even when other socio-demographic characteristics are controlled for. When age, sex and income were controlled for, levels of education remained significantly linked with levels of environmental concern in a majority of the countries for which models were run – 21 out of 29 for environmental action and comparative environmental concern and slightly fewer (16 out of 29) for absolute environmental concern. However, when measures of environmental knowledge were added to the models, this relationship disappeared in a substantial number of countries – 9 for absolute environmental concern, 7 for comparative environmental concern and 3 for environmental action. Nevertheless, even when environmental knowledge was controlled for, along with socio-demographic characteristics, levels of education were still linked with levels of environmental concern in around two-thirds of countries for environmental action, around half of the countries for comparative environmental concern and around one-quarter of the countries for absolute environmental concern.

Table 2 Variables measuring levels of education

	Model 1 (age, sex, income, education)	Model 2 (age, sex, income, education, self-assessed environmental knowledge, objectively measured environmental knowledge (where available))
	Number of countries where education levels linked to environmental concern	Number of countries where education levels linked to environmental concern
Absolute concern	16 of 29 countries	7 of 29 countries
Comparative environmental concern	21 of 29 countries	14 of 29 countries
Environmental action	21 of 29 countries	18 of 29 countries

We next consider the specific models for individual measures of environmental concern in more detail. In each case, we present the P values for each level of education within a country (indicating whether its relationship with levels of environmental concern was significant), along with the predicted probability of expressing environmental concern for an 'average' individual with that level of education. The latter are presented for individual countries to depict the broad patterns identified from the results of the regression analyses.

b) Absolute environmental concern

When we ran basic models including age, sex, income and education levels for each individual country, at least one education level was found to significantly link with levels of absolute environmental concern in 16 of the 29 countries for which data was available, even when their links with these characteristics had been controlled for. In many of these countries, the probabilities of an 'average' individual, with a particular level of education, expressing absolute environmental concern were markedly different – with those with higher level qualifications being more likely to express concern in each case.

- In Bulgaria, the probability of an average individual with no or a low level education qualification, a secondary qualification and a tertiary qualification expressing environmental concern were 5%, 49% and 65% respectively.
- The equivalent probabilities for an average individual with low, secondary and tertiary level qualifications in Great Britain were 41%, 53% and 70%.
- In Turkey, the associated probabilities of expressing absolute environmental control were 46%, 56% and 77% for an average individual with a low, secondary or tertiary level qualification.

When self-rated and (where available) objectively-measured environmental knowledge were added to the models, levels of education remained significantly related to levels of environmental concern in 7 countries - Bulgaria, Croatia, Israel, Latvia, Switzerland, Turkey and Great Britain. The reduction in the existence of this relationship across the set of 29 countries as a whole suggests that, in certain countries, the initial role of education levels in explaining levels of environmental concern was, in part, a result of the links between levels of education per se and levels of environmental knowledge in particular. This is not in itself surprising, as one obvious source of knowledge of the environmental issues is formal education.

Table 3 Results of logistic regression models of relationship between levels of education and absolute environmental concern, in 29 countries, 2010

Country	Level of education	Model 1		Model 2	
		P value	Predicted probability	P value	Predicted probability
Argentina	No / low	-	58%	-	66%
	Secondary	0.001**	71%	0.095	72%
	Tertiary	0**	76%	0.384	70%
Austria	No / low	-	51%	-	55%
	Secondary	0.826	52%	0.641	52%
	Tertiary	0.128	63%	0.611	59%
Belgium	No / low	-	65%	-	69%
	Secondary	0.176	57%	0.114	59%
	Tertiary	0.318	71%	0.941	69%
Bulgaria	No / low	-	5%	-	12%
	Secondary	0**	49%	0**	51%
	Tertiary	0**	65%	0**	62%
Canada	No / low	-	62%	-	67%
	Secondary	0.213	74%	0.357	76%
	Tertiary	0.033*	82%	0.149	80%
Chile	No / low	-	45%	-	51%
	Secondary	0.612	48%	0.823	50%
	Tertiary	0.006**	66%	0.241	59%
Croatia	No / low	-	26%	-	27%
	Secondary	0.024*	39%	0.036*	40%
	Tertiary	0**	53%	0.017*	44%
Czech Rep	No / low	-	18%	-	24%
	Secondary	0.129	26%	0.928	24%
	Tertiary	0.001**	44%	0.493	29%
Denmark	No / low	-	41%	-	63%
	Secondary	0.973	41%	0.214	47%
	Tertiary	0.326	51%	0.406	52%

Finland	No / low	-	59%	-	60%
	Secondary	0.968	60%	0.953	60%
	Tertiary	0.072	69%	0.054	73%
Germany	No / low	-	54%	-	61%
	Secondary	0.113	60%	0.903	60%
	Tertiary	0.004**	68%	0.179	68%
Israel	No / low	-	41%	-	45%
	Secondary	0.004**	61%	0.019*	62%
	Tertiary	0.001**	64%	0.014*	64%
Japan	No / low	-	62%	-	62%
	Secondary	0.154	69%	0.08	70%
	Tertiary	0.194	69%	0.138	69%
S Korea	No / low	-	61%	-	71%
	Secondary	0.974	61%	0.333	63%
	Tertiary	0.538	67%	0.568	66%
Latvia	No / low	-	45%	-	47%
	Secondary	0.013*	62%	0.013*	64%
	Tertiary	0.044*	61%	0.17	58%
Mexico	No / low	-	58%	-	60%
	Secondary	0.499	63%	0.488	64%
	Tertiary	0.705	55%	0.383	53%
N Zealand	No / low	-	44%	-	76%
	Secondary	0.325	44%	0.392	71%
	Tertiary	0.557	53%	0.784	74%
Norway	No / low	-	63%	-	44%
	Secondary	0.979	64%	0.861	46%
	Tertiary	0.243	62%	0.349	52%
Philippines	No / low	-	63%	-	66%
	Secondary	0.75	64%	0.725	65%
	Tertiary	0.875	62%	0.32	62%
Russia	No / low	--	35%	-	47%
	Secondary	0.119	51%	0.537	56%
	Tertiary	0.06	56%	0.475	58%
Slovak Rep	No / low	-	17%	-	23%
	Secondary	0.004**	33%	0.098	35%
	Tertiary	0.001**	39%	0.155	35%
Slovenia	No / low	-	68%	-	73%
	Secondary	0.053	78%	0.265	79%
	Tertiary	0.134	78%	0.532	77%
S Africa	No / low	-	37%	-	39%
	Secondary	0.715	38%	0.129	34%
	Tertiary	0.011*	52%	0.323	46%
Spain	No / low	-	59%	-	73%
	Secondary	0.003**	69%	0.783	72%
	Tertiary	0**	77%	0.438	76%
Sweden	No / low	-	39%	-	40%
	Secondary	0.452	43%	0.354	46%
	Tertiary	0.021*	53%	0.1	50%
Switzerland	No / low	-	60%	-	64%
	Secondary	0.039*	71%	0.177	71%

	Tertiary	0.002**	79%	0.037*	77%
Turkey	No / low	-	46%	-	51%
	Secondary	0.002**	56%	0.106	57%
	Tertiary	0**	77%	0**	73%
G Britain	No / low	-	41%	-	48%
	Secondary	0.028*	53%	0.207	56%
	Tertiary	0**	70%	0.003**	69%
U States	No / low	-	61%	-	59%
	Secondary	0.769	64%	0.495	67%
	Tertiary	0.613	67%	0.56	66%

* = significant at 95% level

** = significant at 99% level

- Self-assessed knowledge of the environment was measured in all countries. Objectively-assessed knowledge of the environmental was only measured in 13 of the 29 countries (Denmark, Finland, Germany, South Korea, Mexico, New Zealand, Philippines, Russia, Slovak Republic, Spain, Switzerland, Turkey and Great Britain).

c) Comparative environmental concern

When we ran basic models including age, sex, income and education levels for each individual country, education levels were found to significantly explain levels of comparable environmental concern in 21 of the 29 countries for which data was available, even when their links with these characteristics had been controlled for. This is a higher number than was identified in relation to absolute environmental concern – suggesting that levels of education may have a more consistent role in explaining this particular measure of environmental concern. In many of the countries where such a relationship was identified, the probabilities of an ‘average’ individual, with a particular level of education, expressing comparative environmental concern were markedly different – with those with higher levels of education being more likely to express concern in each case.

- In Belgium, the probability of an average individual with no or a low level education qualification, a secondary qualification and a tertiary qualification expressing comparative environmental concern were 21%, 28% and 50% respectively.
- The equivalent probabilities for an average individual with low, secondary and tertiary level qualifications in Canada were 19%, 52% and 68%.
- In Great Britain, the associated probabilities of expressing comparative environmental control were 17%, 35% and 50% for an average individual with a low, secondary or tertiary level qualification.

The eight countries where levels of education were not significantly linked with levels of comparative environmental concern when the basic set of models were run were Chile, Finland, South Korea, Mexico, Philippines, Russia, South Africa and Turkey.

When self-rated and objectively-measured environmental knowledge (where available) were added to the models, levels of education remained significantly related to levels of comparative environmental concern in just under half of the countries for which models were ran – 14 out of 29. These countries were Austria, Belgium, Canada, Denmark, Germany, Israel, Japan, New Zealand, Norway, Slovak Republic, Slovenia, Spain, Sweden and Great Britain.

The reduction in the existence of this relationship across the set of 29 countries as a whole suggests that, in around one third of countries, the initial role of education levels in

explaining levels of comparative environmental concern was, in part, a result of the links between levels of education per se and levels of environmental knowledge in particular, as was also the case with absolute environmental concern.

Table 4 Results of logistic regression models of relationship between levels of education and comparative environmental concern, in 29 countries, 2010

Country	Level of education	Model 1 (basic)		Model 2 (full)	
		P value	Predicted probability	P value	Predicted probability
Argentina	No / low	-	48%	-	51%
	Secondary	0.182	53%	0.592	53%
	Tertiary	0.008**	61%	0.204	58%
Austria	No / low	-	38%	-	42%
	Secondary	0.125	47%	0.515	46%
	Tertiary	0**	66%	0.012*	63%
Belgium	No / low	-	21%	-	24%
	Secondary	0.189	28%	0.453	28%
	Tertiary	0**	50%	0.001**	48%
Bulgaria	No / low	-	25%	-	34%
	Secondary	0.117	39%	0.54	41%
	Tertiary	0.027*	46%	0.34	45%
Canada	No / low	-	19%	-	20%
	Secondary	0.003**	52%	0.003**	52%
	Tertiary	0**	68%	0**	67%
Chile	No / low	-	32%	-	33%
	Secondary	0.825	33%	0.867	34%
	Tertiary	0.265	40%	0.433	38%
Croatia	No / low	-	27%	-	28%
	Secondary	0.668	30%	0.809	30%
	Tertiary	0.011*	45%	0.075	41%
Czech Rep	No / low	-	24%	-	28%
	Secondary	0.141	33%	0.455	33%
	Tertiary	0.007**	46%	0.188	40%
Denmark	No / low	-	24%	-	32%
	Secondary	0.022*	49%	0.105	52%
	Tertiary	0.001**	61%	0.011*	63%
Finland	No / low	-	35%	-	41%
	Secondary	0.352	30%	0.186	32%
	Tertiary	0.128	44%	0.568	45%
Germany	No / low	-	42%	-	43%
	Secondary	0.006**	52%	0.09	51%
	Tertiary	0**	68%	0**	68%
Israel	No / low	-	14%	-	15%
	Secondary	0.002**	33%	0.003**	33%
	Tertiary	0**	43%	0**	43%
Japan	No / low	-	25%	-	25%
	Secondary	0.039*	35%	0.053	35%
	Tertiary	0.004**	40%	0.004**	41%
S Korea	No / low	-	66%	-	66%
	Secondary	0.265	57%	0.333	58%
	Tertiary	0.551	71%	0.661	70%

Latvia	No / low	-	22%	-	23%
	Secondary	0.588	25%	0.181	25%
	Tertiary	0.005**	42%	0.208	42%
Mexico	No / low	-	49%	-	49%
	Secondary	0.956	49%	0.874	48%
	Tertiary	0.514	44%	0.668	45%
N Zealand	No / low	-	20%	-	23%
	Secondary	0**	42%	0.001**	42%
	Tertiary	0**	50%	0**	51%
Norway	No / low	-	41%	-	41%
	Secondary	0.93	40%	0.896	42%
	Tertiary	0.006**	62%	0.007**	62%
Philippines	No / low	-	19%	-	17%
	Secondary	0.76	18%	0.661	18%
	Tertiary	0.341	16%	0.986	17%
Russia	No / low	--	24%	-	34%
	Secondary	0.542	30%	0.766	30%
	Tertiary	0.159	39%	0.549	43%
Slovak Rep	No / low	-	20%	-	17%
	Secondary	0.033*	33%	0.013*	32%
	Tertiary	0.004**	41%	0.005**	38%
Slovenia	No / low	-	14%	-	14%
	Secondary	0.002**	30%	0.003**	30%
	Tertiary	0**	46%	0**	45%
S Africa	No / low	-	32%	-	32%
	Secondary	0.651	31%	0.717	31%
	Tertiary	0.642	35%	0.613	35%
Spain	No / low	-	30%	-	37%
	Secondary	0.005**	39%	0.592	39%
	Tertiary	0**	53%	0.013*	49%
Sweden	No / low	-	38%	-	39%
	Secondary	0.114	46%	0.127	48%
	Tertiary	0**	65%	0**	64%
Switzerland	No / low	-	36%	-	42%
	Secondary	0.013*	49%	0.148	50%
	Tertiary	0**	66%	0.175	63%
Turkey	No / low	-	34%	-	37%
	Secondary	0.132	39%	0.734	38%
	Tertiary	0.102	42%	0.808	38%
G Britain	No / low	-	17%	-	22%
	Secondary	0**	35%	0.009**	39%
	Tertiary	0**	50%	0**	47%
U States	No / low	-	24%	-	26%
	Secondary	0.216	38%	0.241	40%
	Tertiary	0.032*	50%	0.07	48%

* = significant at 95% level

** = significant at 99% level

- Self-assessed knowledge of the environment was measured in all countries. Objectively-assessed knowledge of the environmental was only measured in 13 of the 29 countries (Denmark, Finland, Germany, South Korea, Mexico, New Zealand, Philippines, Russia, Slovak Republic, Spain, Switzerland, Turkey and Great Britain).

d) Environmental action

As noted previously, individuals were much less likely to report having been involved in environmental action in the last five years, as compared to expressing absolute or comparative environmental concern.

When we ran basic models including age, sex, income and education levels for each individual country, education levels were found to significantly link to levels of environmental action in 21 of the 29 countries for which data was available, even when their links with these characteristics had been controlled for. In many of these countries, the probabilities of 'average' individuals, with particular levels of education, having undertaken environmental action were markedly different – with those with higher levels of education being much more likely to have done this in each case.

- In Argentina, the probability of an average individual with no or a low level education qualification, a secondary qualification and a tertiary qualification having undertaken environmental action in the last 5 years were 7%, 13% and 41% respectively.
- The equivalent probabilities for an average individual with low, secondary and tertiary level qualifications in the Czech Republic were 5%, 16% and 40%.
- In Switzerland, the associated probabilities of having undertaken environmental action were 15%, 44% and 63% for an average individual with a low, secondary or tertiary level qualification.

The eight countries where levels of education were not significantly linked with levels of environmental action, for the basic models, were Canada, Denmark, Japan, Latvia, Mexico, Russia, Sweden and the United States.

When self-rated and objectively-measured environmental knowledge (where available) were added to the models, levels of education remained significantly related to levels of environmental action in over half of the countries for which models were ran – 18 out of 29.

The reduction in the existence of this relationship across the set of 29 countries as a whole suggests that, in three countries, the initial role of education levels in explaining levels of comparative environmental concern was, in part, a result of the links between levels of education per se and levels of environmental knowledge in particular. This was the case for Israel, Norway and South Africa specifically.

Table 5 Results of linear regression models of relationship between levels of education and environmental action, in 29 countries, 2010

Country	Level of education	Model 1 (basic)		Model 2 (full)	
		P value	Predicted probability	P value	Predicted probability
Argentina	No / low	-	7%	-	8%
	Secondary	0.007**	13%	0.105	12%
	Tertiary	0**	41%	0**	3%
Austria	No / low	-	22%	-	23%
	Secondary	0.006**	35%	0.026*	35%
	Tertiary	0.003**	42%	0.025*	39%
Belgium	No / low	-	19%	-	21%
	Secondary	0.488	23%	0.799	22%
	Tertiary	0**	43%	0.004**	40%

Bulgaria	No / low	-	Omitted	-	Omitted
	Secondary	0.001**	6%	0.004**	6%
	Tertiary	Omitted	15%	Omitted	15%
Canada	No / low	-	31%	-	30%
	Secondary	0.352	43%	0.26	44%
	Tertiary	0.178	49%	0.195	47%
Chile	No / low	-	9%	-	10%
	Secondary	0.75	10%	0.995	10%
	Tertiary	0**	29%	0.009**	24%
Croatia	No / low	-	6%	-	6%
	Secondary	0.043*	14%	0.04*	14%
	Tertiary	0**	29%	0.001**	24%
Czech Rep	No / low	-	5%	-	7%
	Secondary	0.015*	16%	0.064	17%
	Tertiary	0**	40%	0.001**	33%
Denmark	No / low	-	18%	-	24%
	Secondary	0.334	27%	0.471	32%
	Tertiary	0.213	30%	0.591	30%
Finland	No / low	-	23%	-	23%
	Secondary	0.402	27%	0.363	28%
	Tertiary	0.004**	37%	0.019*	39%
Germany	No / low	-	19%	-	21%
	Secondary	0.01**	27%	0.08	27%
	Tertiary	0**	45%	0**	42%
Israel	No / low	-	10%	-	11%
	Secondary	0.408	15%	0.65	14%
	Tertiary	0.013*	28%	0.074	22%
Japan	No / low	-	14%	-	13%
	Secondary	0.804	15%	0.881	14%
	Tertiary	0.642	15%	0.782	14%
S Korea	No / low	-	3%	-	3%
	Secondary	0.002**	19%	0.004**	20%
	Tertiary	0**	30%	0**	29%
Latvia	No / low	-	6%	-	5%
	Secondary	0.855	6%	0.814	6%
	Tertiary	0.05	14%	0.162	11%
Mexico	No / low	-	18%	-	17%
	Secondary	0.932	19%	0.92	18%
	Tertiary	0.938	19%	0.835	16%
N Zealand	No / low	-	32%	-	33%
	Secondary	0.005**	48%	0.022*	48%
	Tertiary	0.001**	49%	0.009**	49%
Norway	No / low	-	18%	-	20%
	Secondary	0.124	28%	0.188	29%
	Tertiary	0.016*	35%	0.055	33%
Philippines	No / low	-	6%	-	6%
	Secondary	0.449	8%	0.5	7%
	Tertiary	0**	17%	0.001**	16%
Russia	No / low	-	6%	-	4%
	Secondary	0.796	7%	0.729	6%

	Tertiary	0.322	12%	0.37	10%
Slovak Rep	No / low	-	10%	-	12%
	Secondary	0.016*	19%	0.19	19%
	Tertiary	0**	39%	0.001**	36%
Slovenia	No / low	-	5%	-	6%
	Secondary	0.029*	13%	0.135	12%
	Tertiary	0**	27%	0.005**	24%
S Africa	No / low	-	6%	-	5%
	Secondary	0.159	9%	0.25	7%
	Tertiary	0.027*	13%	0.075	10%
Spain	No / low	-	10%	-	14%
	Secondary	0**	23%	0.003**	24%
	Tertiary	0**	45%	0**	42%
Sweden	No / low	-	30%	-	31%
	Secondary	0.344	35%	0.376	36%
	Tertiary	0.087	40%	0.224	38%
Switzerland	No / low	-	15%	-	17%
	Secondary	0**	44%	0**	45%
	Tertiary	0**	63%	0**	63%
Turkey	No / low	-	2%	-	2%
	Secondary	0**	8%	0.004**	7%
	Tertiary	0**	18%	0**	13%
G Britain	No / low	-	12%	-	14%
	Secondary	0.003**	26%	0.012**	29%
	Tertiary	0**	46%	0**	40%
U States	No / low	-	26%	-	31%
	Secondary	0.385	18%	0.214	17%
	Tertiary	0.477	34%	0.916	29%

* = significant at 95% level

** = significant at 99% level

- Self-assessed knowledge of the environment was measured in all countries. Objectively-assessed knowledge of the environmental was only measured in 13 of the 29 countries (Denmark, Finland, Germany, South Korea, Mexico, New Zealand, Philippines, Russia, Slovak Republic, Spain, Switzerland, Turkey and Great Britain).
- It was not possible to calculate predicted probabilities for those with no or a low level qualification in Bulgaria, as all respondents in this category reported undertaking no environmental action in the period of interest. As a result, the reference category use for Bulgaria was tertiary.

How does the relationship between levels of education and levels of environmental concern vary in different countries?

From the results presented above, it is clear that the nature of the relationship between levels of education and levels of environmental concern varies for different countries, with no significant relationship existing for particular measures in a minority of cases and significant relationships existing, before and once levels of environmental knowledge have been controlled for, in the majority of instances. However, do stronger relationships between levels of education and the range of measures of environmental concern considered exist in certain countries? In the table below, we summarise the results of the models examined previously for each individual country, with an indication of where a significant relationship between levels of education and a particular measure of environmental concern was identified.

From these data, a number of patterns can be detected. Levels of education significantly link with all three measures of environmental concern in at least one of the models in 10 of the 29 countries; these are Belgium, Bulgaria, Croatia, Czech Republic, Germany, Israel, Slovak Republic, Spain, Switzerland and Great Britain. Interestingly, all of these countries are European, suggesting levels of education have the strongest links with levels of environmental concern in this geographic region. On the other hand, no relationship between levels of education and environmental concern are identified in 2010 in two countries – Mexico and Russia, adding further weight to the conclusion that this relationship is strongest in European countries – and perhaps those which are better-off economically.

Table 6 Significant links between levels of education and measures of environmental concern identified in 29 individual countries, 2010

Country	Absolute environmental concern		Comparative environmental concern		Environmental action	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Argentina	x		x		x	X
Austria			x	x	x	x
Belgium			x	x	x	X
Bulgaria	x	X	x		x	x
Canada	X		x	x		
Chile	X				X	X
Croatia	x	X	x		x	x
Czech Rep	x		x		X	X
Denmark			x	x		
Finland					X	X
Germany	x		x	x	x	x
Israel	x	x	x	x	x	
Japan			x	x		
S Korea					x	x
Latvia	x	x	x			
Mexico						
N Zealand			x	x	x	x
Norway			x	x	x	
Philippines					x	x
Russia						
Slovak Rep	x		x	x	x	x
Slovenia			x	x	x	x
S Africa	x				x	
Spain	x		x	x	x	x
Sweden	x		x	x		
Switzerland	x	x	x		x	x
Turkey	x	x			x	x
Great Britain	x	x	x	x	x	x
United States			x			

X = significant difference identified at 99% or 95% level

We next turn to consider whether the level and nature of the relationships between levels of education and environmental concern identified for individual countries in 2010 are

comparable to those which existed in the past, or if the link between the two factors is strengthening or weakening.

How has the relationship between levels of education and environmental concern changed over time?

In this section, we focus on the two measures of environmental concern for which data was collected as part of the International Social Survey Programme in 1993, 2000 and 2010 – namely that measuring comparative environmental concern (as compared to concern about jobs and prices) and reported environmental action over the past 5 years.

Because participation in ISSP is voluntary and continually expanding, the range of countries who participated in 1993 and 2000 is smaller than that which participated in 2010. Therefore, the analysis below is limited to those 13 countries which participated in all three years of the programme which focussed on measuring attitudes to the environment. Given the small number of countries for which comparative data is available over time, for this analysis, we only include variables which are available for all countries at each point in time. It should be noted that there was a tendency for countries in Europe and better-off countries to join the ISSP programme at an earlier date, meaning that the trends we report in relation to 2010 in this analysis may not exactly replicate those presented, in relation to a larger set of countries, above.

Given the small number of countries for which comparative data is available over time, for this analysis, we have run two sets of models for each of the two measures. The first includes age, sex and level of education, available for all countries at each point in time. The second set of models includes objectively measured environmental knowledge, where available (this was based on two optional questions, and so was not available for all countries in all three years). We do not include a measure of income in this set of models, as measures of this characteristic were included in a number of different ways across the three years and among the countries participating, making the drawing of universal conclusions very challenging.

a) Comparative environmental concern: change over time

The tables below present results of two models for each measure of environmental concern, for the 13 countries which participated in ISSP 1993, 2000 and 2010.

As shown in Table 7, levels of education were found to relate to levels of comparative environmental concern, even when their links with age and sex were controlled for, in 10 of the 13 countries examined in 1993, 11 of the 13 countries in 2000 and the same number in 2010. In each instance where a significant relationship was found, higher levels of education were associated with higher levels of comparative environmental concern. A significant relationship between levels of education and levels of environmental concern was found across all three years in the Czech Republic, Germany, Great Britain, Japan, Norway, Slovenia, Spain and the United States. In the Philippines and Russia, such a relationship was evident in 1993, but not in the later years for which data is available. In Bulgaria, Canada and New Zealand the opposite trend is evident – with a significant relationship not being evident in 1993, but being identified in both 2000 and 2010.

Table 7 Results of logistic regression models of relationship between levels of education and comparative environmental concern, in 23 countries, 1993, 2000 and 2010

Country	Level of education	1993		2000		2010	
		P value	Predicted Probability	P value	Predicted Probability	P value	Predicted Probability
Bulgaria	No / low	-	75%	-	32%	-	26%
	Secondary	0.936	75%	0.294	37%	0.122	39%
	Tertiary	0.108	81%	0.013*	45%	0.038*	44%
Canada	No / low	-	51%	-	46%	-	24%
	Secondary	0.898	50%	0.554	50%	0.001**	51%
	Tertiary	0.5	48%	0.008**	66%	0**	68%
Czech Rep	No / low	-	35%	-	38%	-	28%
	Secondary	0**	49%	0.779	40%	0.347	33%
	Tertiary	0**	65%	0**	66%	0.004**	46%
Germany	No / low	-	57%	-	46%	-	41%
	Secondary	0.015*	65%	0.224	50%	0.01**	50%
	Tertiary	0**	77%	0.001**	62%	0**	70%
G Britain	No / low	-	56%	-	29%	-	15%
	Secondary	0.057	65%	0**	54%	0**	34%
	Tertiary	0**	76%	0**	70%	0**	53%
Japan	No / low	-	69%	-	41%	-	23%
	Secondary	0.254	73%	0.262	46%	0.019*	34%
	Tertiary	0.003**	81%	0.003**	59%	0	40%
N Zealand	No / low	-	71%	-	43%	-	20%
	Secondary	0.939	70%	0.244	51%	0**	42%
	Tertiary	0.66	76%	0.002**	66%	0**	50%
Norway	No / low	-	60%	-	36%	-	36%
	Secondary	0.017*	69%	0.001**	52%	0.631	39%
	Tertiary	0**	86%	0**	73%	0**	62%
Philippines	No / low	-	57%	-	25%	-	19%
	Secondary	0.198	64%	0.61	23%	0.881	18%
	Tertiary	0**	79%	0.236	30%	0.429	16%
Russia	No / low	-	50%	-	46%	-	25%
	Secondary	0.806	49%	0.428	50%	0.686	29%
	Tertiary	0.076	58%	0.125	54%	0.178	39%
Slovenia	No / low	-	41%	-	25%	-	14%
	Secondary	0**	63%	0.005**	36%	0**	28%
	Tertiary	0**	78%	0**	53%	0**	46%
Spain	No / low	-	57%	-	34%	-	29%
	Secondary	0.085	64%	0.001**	55%	0.002**	38%
	Tertiary	0**	75%	0**	68%	0**	49%
USA	No / low	-	39%	-	25%	-	24%
	Secondary	0**	59%	0.136	36%	0.416	30%
	Tertiary	0**	73%	0**	54%	0.003**	48%

* = significant at 95% level

** = significant at 99% level

When objectively-measured environmental knowledge was added to the regression models (in the years where there were available), levels of education continued to exhibit a significant relationship with levels of environmental concern in the majority of countries – with the direction of the relationship being the same as that reported previously. This was the case for 10 of the 13 countries in both 1993 and 2000, and four of the six countries for which objectively-measured environmental knowledge was measured in 2010.

Looking over time, we see that a significant relationship between levels of education and comparative environmental concern existed at all points in time for which data was available for eight countries - the Czech Republic, Germany, Great Britain, Japan, Norway, Slovenia, Spain and the United States. In the Philippines and Russia, a significant relationship was identified in 1993 but not in the latter two years (reflecting the findings in relation to the basic models). In Bulgaria, a significant relationship was evident for the first time in 2010; in New Zealand this relationship emerged in 2000 and persisted in 2010.; in Canada, where data for this model was not available for 2010, such a relationship also appeared for the first time in 2000.

Table 8 Results of logistic regression models of relationship between levels of education and comparative environmental concern (including environmental knowledge), in 13 countries, 1993, 2000 and 2010

Country	Level of education	1993		2000		2010	
		P value	Predicted Probability	P value	Predicted Probability	P value	Predicted Probability
Bulgaria	No / low	-	74%	-	35%	-	41%
	Secondary	0.684	76%	0.761	33%	0.037	49%
	Tertiary	0.117	81%	0.172	45%	0**	72%
Canada	No / low	-	50%	-	44%	-	-
	Secondary	0.967	50%	0.358	51%	-	-
	Tertiary	0.773	49%	0.004**	66%	-	-
Czech Rep	No / low	-	32%	-	39%	-	-
	Secondary	0**	50%	0.766	41%	-	-
	Tertiary	0**	67%	0.001**	65%	-	-
Germany	No / low	-	72%	-	49%	-	-
	Secondary	0.337	76%	0.589	51%	-	-
	Tertiary	0**	89%	0.017*	62%	-	-
G Britain	No / low	-	59%	-	30%	-	19%
	Secondary	0.018*	70%	0**	55%	0.007**	35%
	Tertiary	0**	76%	0**	70%	0**	52%
Japan	No / low	-	68%	-	43%	-	-
	Secondary	0.127	74%	0.33	48%	-	-
	Tertiary	0.004**	81%	0.038*	56%	-	-
N Zealand	No / low	-	80%	-	44%	-	20%
	Secondary	0.554	72%	0.251	53%	0**	42%
	Tertiary	0.795	77%	0.011*	65%	0**	51%
Norway	No / low	-	65%	-	41%	-	-
	Secondary	0.044*	73%	0.011*	54%	-	-

	Tertiary	0**	86%	0**	73%	-	-
Philippines	No / low	-	52%	-	24%	-	17%
	Secondary	0.083	65%	0.77	23%	0.57	19%
	Tertiary	0**	80%	0.178	29%	0.812	16%
Russia	No / low	-	51%	-	44%	-	38%
	Secondary	0.573	49%	0.236	52%	0.454	29%
	Tertiary	0.287	57%	0.08**	54%	0.794	42%
Slovenia	No / low	-	42%	-	25%	-	-
	Secondary	0**	65%	0.01**	36%	-	-
	Tertiary	0**	77%	0**	53%	-	-
Spain	No / low	-	58%	-	39%	-	32%
	Secondary	0.048*	66%	0.002**	57%	0.066*	38%
	Tertiary	0**	77%	0**	71%	0**	49%
USA	No / low	-	43%	-	28%	-	-
	Secondary	0**	62%	0.188	38%	-	-
	Tertiary	0**	72%	0.002**	54%	-	-

* = significant at 95% level

** = significant at 99% level

From the data reported above, we can conclude that the relationship between levels of education and comparative environmental concern has broadly remained consistent (in terms of existence and direction) over the past two decades in most countries for which data is available, with a small number of exceptions. While it is striking from the predicted probabilities reported above that comparative environmental concern has declined substantially over time in most countries, the fact that a relationship persists with levels of education, suggests that this is not a result of changes in levels of the latter characteristic.

b) Environmental action

When we came to examine environmental action, we also find that levels of education are significantly associated in almost all countries for which data is available, when age and sex are controlled for. This was the case for 11 of the 12 countries for which data was available in 1993, 12 of the 13 countries in 2000 and 11 of 13 countries in 2010 (environmental action was not measured in the United States in 1993). The only three countries where a significant relationship of this kind was not evident at all three points in time were Bulgaria (where this was not evident in 1993) and Japan and Russia (where this existed in earlier years but not in 2010).

Table 9 Results of linear regression models of relationship between levels of education and environmental action, in 13 countries, 1993, 2000 and 2010

Country	Level of education	1993		2000		2010	
		P value	Predicted Probability	P value	Predicted Probability	P value	Predicted Probability
Bulgaria	No / low	-	23%	-	15%	-	-
	Secondary	0.112	18%	0.001**	22%	0**	6%
	Tertiary	0.275	19%	0**	41%	-	17%
Canada	No / low	-	10%	-	20%	-	22%

	Secondary	0.016*	17%	0.096	33%	0.062	43%
	Tertiary	0**	30%	0**	53%	0.042*	46%
Czech Re	No / low	-	9%	-	14%	-	6%
	Secondary	0**	20%	0.326	18%	0.002**	17%
	Tertiary	0**	29%	0.001**	36%	0**	34%
Germany	No / low	-	25%	-	30%	-	18%
	Secondary	0**	38%	0**	43%	0.002**	27%
	Tertiary	0**	46%	0**	59%	0**	48%
G Britain	No / low	-	35%	-	20%	-	12%
	Secondary	0.111	43%	0**	38%	0.003**	26%
	Tertiary	0**	54%	0**	52%	0**	45%
Japan	No / low	-	18%	-	16%	-	13%
	Secondary	0**	32%	0.011*	25%	0.563	15%
	Tertiary	0**	37%	0**	38%	0.503	15%
N Zealand	No / low	-	29%	-	31%	-	32%
	Secondary	0.379	40%	0.014*	49%	0.004**	47%
	Tertiary	0.013*	63%	0**	66%	0.001**	48%
Norway	No / low	-	29%	-	21%	-	19%
	Secondary	0.73	31%	0.058	30%	0.131	27%
	Tertiary	0**	44%	0**	45%	0.008**	35%
Philippines	No / low	-	12%	-	4%	-	7%
	Secondary	0.125	19%	0.057	8%	0.669	8%
	Tertiary	0.007**	25%	0**	18%	0**	18%
Russia	No / low	-	23%	-	3%	-	5%
	Secondary	0.112	18%	0.228	6%	0.735	7%
	Tertiary	0.275	19%	0.058	9%	0.220	13%
Slovenia	No / low	-	20%	-	14%	-	3%
	Secondary	0.038	25%	0.005**	23%	0.001**	14%
	Tertiary	0.008**	28%	0**	39%	0**	32%
Spain	No / low	-	13%	-	13%	-	9%
	Secondary	0**	27%	0.023*	22%	0**	23%
	Tertiary	0**	41%	0**	45%	0**	45%
USA	No / low	-	-	-	15%	-	18%
	Secondary	-	-	0.273	22%	0.472	14%
	Tertiary	-	-	0.001**	41%	0.014*	34%

* = significant at 95% level

** = significant at 99% level

When a measure of environmental knowledge was added to the models, the relationship between levels of education and levels of environmental action persisted in 10 of the 12 countries in 1993, all 13 countries in 2000 and 5 of the 6 countries for which data was available in 2010. Such a relationship was not evident in Bulgaria or Germany in 1993 but emerged in later years; for Russia the opposite was true, with the significant relationship identified in 1993 and 2000 no longer being evident in 2010.

These findings suggest that, for this sub-set of countries, the relationship between levels of education in explaining levels of environmental action has persisted (in both its existence and direction) over time, and remains evident even when measure of environmental knowledge are accounted for – suggesting that generic education and educational qualifications may be making a unique contribution here.

Table 10 Results of linear regression models of relationship between levels of education and environmental action (including environmental knowledge), in 13 countries, 1993, 2000 and 2010

Country	Level of education	1993		2000		2010	
		P value	Predicted Probability	P value	Predicted Probability	P value	Predicted Probability
Bulgaria	No / low	-	23%	-	1%	-	19%
	Secondary	0.398	20%	0.013*	10%	0.008**	28%
	Tertiary	0.743	22%	0.001**	16%	0**	48%
Canada	No / low	-	10%	-	22%	-	-
	Secondary	0.015*	17%	0.114	35%	-	-
	Tertiary	0**	30%	0.001**	53%	-	-
Czech Rep	No / low	-	9%	-	16%	-	-
	Secondary	0**	22%	0.571	19%	-	-
	Tertiary	0**	30%	0.005**	35%	-	-
Germany	No / low	-	55%	-	32%	-	-
	Secondary	0.801	54%	0**	43%	-	-
	Tertiary	0.084	65%	0**	56%	-	-
G Britain	No / low	-	37%	-	20%	-	14%
	Secondary	0.192	43%	0**	38%	0.005**	29%
	Tertiary	0**	53%	0**	52%	0**	43%
Japan	No / low	-	20%	-	18%	-	-
	Secondary	0**	34%	0.083	26%	-	-
	Tertiary	0.001**	35%	0.002**	36%	-	-
N Zealand	No / low	-	25%	-	33%	-	32%
	Secondary	0.213	41%	0.038*	50%	0.013*	47%
	Tertiary	0.006**	63%	0**	66%	0.001**	50%
Norway	No / low	-	32%	-	21%	-	-
	Secondary	0.923	32%	0.052	30%	-	-
	Tertiary	0.004**	44%	0**	44%	-	-
Philippines	No / low	-	13%	-	3%	-	7%
	Secondary	0.122	23%	0.033	7%	0.73	8%
	Tertiary	0.018*	30%	0**	17%	0**	18%
Russia	No / low	-	54%	-	3%	-	5%
	Secondary	0.993	54%	0.077	8%	0.803	7%
	Tertiary	0.001**	75%	0.04**	9%	0.294	14%
Slovenia	No / low	-	21%	-	16%	-	-

	Secondary	0.103	26%	0.027*	24%	-	-
	Tertiary	0.014*	30%	0**	40%	-	-
Spain	No / low	-	15%	-	16%	-	11%
	Secondary	0**	30%	0.127	23%	0**	24%
	Tertiary	0**	44%	0**	47%	0**	46%
	No / low	-	-	-	17%	-	-
	Secondary	-	-	0.321	24%	-	-
	Tertiary	-	-	0.002**	42%	-	-

* = significant at 95% level

** = significant at 99% level

Overall, these findings suggest that the relationship between levels of education and the two measures of environmental concern examined have persisted in those countries for which data is available over time, with higher levels of education relating to greater levels of environmental concern (as expressed through both comparative environmental concern and action). Interestingly, even when we controlled for objectively-measured environmental knowledge, this relationship persists – suggesting that education makes a contribution to levels of concern beyond being a proxy for knowledge about environmental issues.

Previous research (which focused on years of education) has found that the extent to which environmental concern can be explained by education levels declined slightly between 1993 and 2000 (Franzen and Meyer); this was also found to be the case for levels of environmental knowledge. The findings above, incorporating data for 2010, suggest that this is not the case; this discrepancy may be explained by the fact that the previous analysis utilized a latent measure of environmental concern, a different measure of level of education, involved a different analytic approach and incorporated analysis for a larger number of countries.

Conclusion

Education levels, in the majority of instances, are linked with levels of environmental concern, even when a range of individual characteristics, likely to be associated with education levels, are controlled for. This is especially true of comparative environmental concern and environmental action, and slightly less true of absolute environmental concern. When we control for levels of environmental knowledge, such a relationship between levels of education and environmental concern is no longer evident in a minority of countries, but still endures in the majority. This suggests that levels of education are making a contribution to levels of environmental concern that extends beyond equipping the individual with knowledge of environmental issues. Interestingly, the existence of relationships between levels of education and environmental concern are most consistently found in European countries and are less likely to exist in countries outside Europe and those which are less well-off.

Inevitably, the distribution of education levels in different countries is changing over time, primarily in the direction of individual countries' populations becoming more educated. Between 1993 and 2010, the relationship between levels of education and levels of environmental concern (namely comparative concern and environmental action) has remained relatively constant in most countries for which data is available for all three points in time. This suggests that we might expect levels of environmental concern to rise in individual countries as their citizens become more educated – although the declines in concern noted since 1993 clearly indicate that other factors are at play here.

Notes

[1} Further information about the International Social Survey Programme can be located at:
<http://www.issp.org/>

References

Franzen, A. and Meyer, R 'Environmental attitudes in cross-national perspective: A Multilevel analysis of the ISSP 1993 and 2000, *European Sociological Review*, 26(2) pp 219-234 (2010).