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Exploring Environmentalism Across Nations: Understanding the Influence of Societal Social Progress on Environmental Values, Norms, and Behaviour

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ABSTRACT

The global push for environmental protection often adopts a universal approach, despite evidence of significant disparities in environmentalism across nations. This study uses data from 28 countries in the International Social Survey Programme (ISSP) 2020 Environment module to explore the determinants of pro-environmental behavior. Applying the value-belief-norm (VBN) framework, it examines how societal progress influences the pathways from environmental values to behaviors, with a particular focus on less developed countries that ranked lower on the Weighted Index of Social Progress (WISP). Initial findings show that certain factors such as self-efficacy, environmental concern, pro-environmental norms, and exposure to environmental problems consistently predict behavior across WISP clusters, though the magnitude and significance of these associations vary. However, country-level variation within clusters highlights the limitations of grouping countries solely on social progress rankings. Future research should consider both between- and within-cluster variation, and examine other potential methods, including multilevel modeling with country-level random slopes.

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Introduction

Regardless of socio-economic status, numerous countries have recognized the salience of environmental problems and have made commitments to support pro-environmental initiatives (Chasek, Downie, and Welsh Brown 2018). Currently, almost 1400 multilateral environmental agreements are in place that aim to govern various elements of national environments, placing an emphasis on cooperation and shared responsibility (Hale 2020). Examples include the Earth Summit Series, the UN Framework Convention on Climate Change, as well as the United Nations General Assembly Sustainable Development Goals (SDGs). Despite the common goal of these agreements

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on protecting the environment and offering a sustainable future, it remains clear that pro-environmental behavior differs both between and within countries (Echavarren 2017).

The urgency of addressing global environmental challenges, such as climate change, has become increasingly apparent in recent years. Climate change, driven primarily by human activities, has caused and continues to cause significant and irreversible environmental damage. This global crisis necessitates immediate and concerted efforts from all countries, relying heavily on commitments from ordinary people within countries. Understanding what motivates and drives the pro-environmental behavior of people in different national contexts therefore becomes crucial for crafting effective policies.

The theory that best explains the drivers and formation of the process of pro-environmental behavior is the value-belief-norm (VBN) theory (Tian and Liu 2022). This theory expands on norm activation theory by incorporating value-based theory and the new environmental paradigm, thereby creating a comprehensive causal value-belief-emotion-norm chain. The VBN framework has been used extensively in environmental studies to explain pro-environmental behaviors, such as reduced car use (Ünal, Steg, and Granskaya 2019; Mahpour et al. 2023), plastic carry bag use (Yakut 2021), recycling (Biswas et al. 2000; Biswas and Roy 2016), electric vehicle adoption (Saleem et al. 2021; Simsekoglu and Klöckner 2019) and wildlife crime (Joshi et al. 2022). It has further been used to explain the acceptability of energy policies and conservation behaviors (Kaiser, Hubner, and Bogner 2005), in addition to green purchasing (Huang 2016). This theory has also been applied to multi-country research (Kotyza et al. 2024; Robles-Avila and Sakib 2023; Singh et al. 2023), though a majority of cross-national studies to date have tended to disregard the varied dimensions of pro-environmental determinants as well as other potentially significant influences (Ghazali et al. 2019; Rampedi and Ifegbesan 2022). These studies mostly apply the VBN model descriptively and do not attempt to understand the magnitude and significance of the components of the VBN, how they relate to each other, and how they differ between country contexts. Disregard for these dimensions may lead to ineffectual pro-environmental initiatives, since the assumption would be that environmental attitudes, values and norms across nations are similar, which might not be the case.

A country's level of social progress might influence environmentalism, since social progress is typically associated with better access to education and other basic services, which, in turn, is likely to be associated with higher levels of environmental consciousness. Social progress also tends to foster critical thinking that enables individuals to question prevailing norms. It also enables individuals to feel more empowered to take action and be more confrontational in terms of things that are important to them. Societies with higher levels of social progress often have more active civil societies, which would include well-established environmental advocacy groups. Social progress therefore creates a context where environmental values are not only more widely held, but can also create pressure to transform actions into concrete actions and policies (Medda, Palmisano, and Sacchi 2022). One of the global indices used to evaluate a country's level of social progress is the Weighted Social Progress Index (WISP), developed by Richard Estes in 1973 (Estes and Morgan 1976; Estes 1997, 2019). WISP is a composite index that measures social progress based on various indicators related to

well-being, inclusiveness, and sustainability within a country. The index provides a holistic assessment of how well a society meets the basic human needs of its citizens, promotes opportunity and rights, and ensures sustainability for future generations. It considers factors such as health, education, personal rights, access to technology, environmental quality, and overall quality of life, and therefore goes beyond just measuring progress in terms of economic achievement. In essence, the WISP aims to capture values, priorities, and indicators beyond traditional economic measures of progress. While previous research has examined postmaterialist values and economic factors, much less is known about how broader societal progress impacts the pathways from environmental values to behaviors across different national contexts.

Research testing the predictive influence of value-belief-norm variables as well as country-level WISP classification on pro-environmental behavior is non-existent. This paper therefore offers a unique opportunity to deepen the understanding of pro-environmental behavior and its drivers in countries with differing levels of social progress. By exploring the different components of the VBN model (attitudinal and behavioral dimensions) as well as determining the relative importance of these components among WISP country clusters, this study ultimately aims to contribute to understanding of how international frameworks can better accommodate diverse national approaches to environmental protection, thereby promoting more equitable and sustainable global outcomes. Given that exposure to environmental problems (objective problems) has been theorized to impact environmentalism, especially among developing countries, this study also includes reported experiences of environmental problems as a mediator to test if these impact pro-environmental values, norms, and behavior differently across the WISP clusters. In sum, this study examines the VBN, its antecedents, and their interrelationships, together with the impact of select socio-demographics and exposure to environmental problems, on pro-environmental behavior among select countries, clustered according to WISP score.

The analysis presented in this article is guided by four research questions. Firstly, does the value-belief-norm theoretical model hold true for ISSP 2020 Environment data, controlling for country differences based on clustered WISP scores? Secondly, how do the determinants of pro-environmental behavior, as per the VBN model, differ between countries clustered by WISP level? Thirdly, how do the determinants of pro-environmental behavior differ within the lowest WISP country cluster (Russia, China, Thailand, South Africa, Taiwan, Philippines, and India)? Lastly, do environmental problems exert a greater influence on pro-environmental behavior in countries with low WISP scores relative to those with higher levels of social progress?

The next section of the article discusses the VBN model in more detail, given that it forms the primary theoretical framework for the analysis. The hypotheses that underscore the analysis are also outlined in this section. This leads into a methodology section that describes the data used, as well as how the countries represented in this cross-national series are classified and clustered according to their WISP scores. The dependent and independent variables are also outlined. After this, the results are presented in three parts. The first subsection presents evidence on the applicability of the VBN model to the data, and establishes whether the value-belief-norm chain of sequence holds, controlling for WISP country cluster. The second subsection tests

whether the different elements of the VBN model (namely attitudes, concern, norms, behavior) remain significant for each separate WISP country cluster. In the last results subsection, the focus is on the degree of consistency of the predictors of pro-environmental behavior among individual countries falling within the lowest WISP cluster, due to a seemingly weaker fit of the VBN model. The article concludes with a summary of evidence relative to the guiding research questions and hypotheses, provides a discussion on the limitations of the study, and offers policy-relevant recommendations.

Theoretical framework

In 1999, the social psychologist Paul Stern developed a value-belief-norm (VBN) model for environmentalism (Stern et al. 1999). He postulated that public support is one of the most important resources of social movements and indeed for behavioral change, and conceptualized the VBN model to better understand the drivers of social movements. The VBN model implies that individuals will support a cause if they accept its underlying values, believe that valued objects are under threat, and feel that their actions can promote change. Overall, the VBN framework provides a useful lens for understanding the complex interplay of values, beliefs, and social norms in shaping individual attitudes and behaviors toward environmental issues. According to this theory, green behaviors are more likely to occur when a causal series of variables, that is values, beliefs, and norms, are all positively associated with an outcome. Although the VBN theory has been tested in different countries, it has been tested less frequently in certain world regions, including Asia and Africa (Hiratsuka, Perlaviciute, and Steg 2018).

This article uses the VBN model as a general framework (Figure 1). Persons with strong environmental values would typically prioritize conservation and their decision-making would be based on a pro-environmental stance. According to the VBN model,

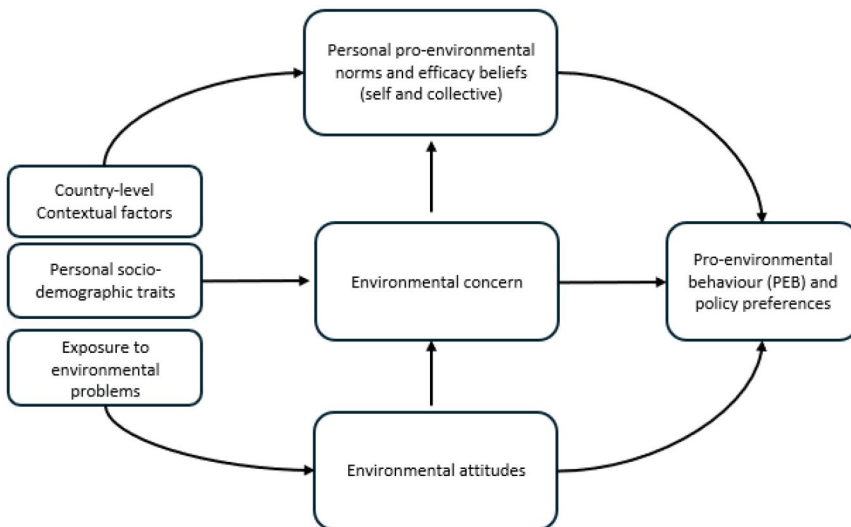


Figure 1. The VBN model (adapted).

beliefs incorporate views or perceptions that individuals hold about the world around them. By extension, environmental beliefs encompass people's thoughts and attitudes about various environmental issues or problems, their causes, and potential solutions. These beliefs are influenced by factors such as personal experiences, education, and environmental exposure. Norms pertain to the social and cultural expectations and standards that influence individuals' behavior. In the context of the VBN model, Stern distinguished between social norms and personal norms. Social norms are the collective beliefs within a society or community about what behaviors are acceptable or appropriate. Individuals are influenced by social norms when deciding whether to engage in pro-environmental actions. Personal norms are an individual's internalized sense of moral obligation. People with strong personal norms regarding environmental issues feel a moral duty to act in environmentally friendly ways, regardless of external pressures. Among all constructs in the VBN model, personal norms have been found to be a successful antecedent of pro-environmental behavior in different settings (Ghazali et al. 2019). An additional element that is added to the overall model of environmental behavior is exposure to environmental problems. It is believed that such exposure could impact all dimensions of environmentalism and ultimately behavior. Below is a conceptual framework of what the article will test among the countries represented in the ISSP Environment 2020 dataset.

To confirm the applicability of the value-belief-norm theoretical framework to the cross-national data, several interrelated hypotheses were tested. Firstly, pro-environmental attitudes were expected to have a significant positive association with environmental concern (H1a). Second, environmental concern is expected to positively influence pro-environmental norms (H1b). Additionally, pro-environmental norms, as well as self-efficacy and collective efficacy beliefs, were expected to have a positive effect on pro-environmental behavior (H1c). Exposure to environmental problems was hypothesized to be positively associated with environmental awareness, concern, norms, and behavior (H1d). These hypotheses were expected to hold true even after controlling for WISP country clusters.

A similar set of hypotheses was formulated regarding the utility of the VBN model in predicting pro-environmental behavior across different WISP country clusters. The general expectation was that the VBN model would similarly predict pro-environmental behavior in each of the WISP clusters. Specifically, the study hypothesized that various predictors would positively influence pro-environmental behavior in each WISP country cluster, namely environmental attitudes (H2a), environmental concern (H2b), pro-environmental norms (H2c), and efficacy beliefs (H2d). Furthermore, exposure to environmental problems was expected to have a positive effect on pro-environmental behavior in each WISP cluster, even after controlling for other environmental determinants and personal socio-demographic attributes (H2e).

Data and methods

This paper uses data from 28 countries that participated in the International Social Survey Programme (ISSP) "Environment" 2020 module. All these country samples are nationally representative and similar questions were fielded in the respondent's own context and language. The countries that participated in the 2020 round provide

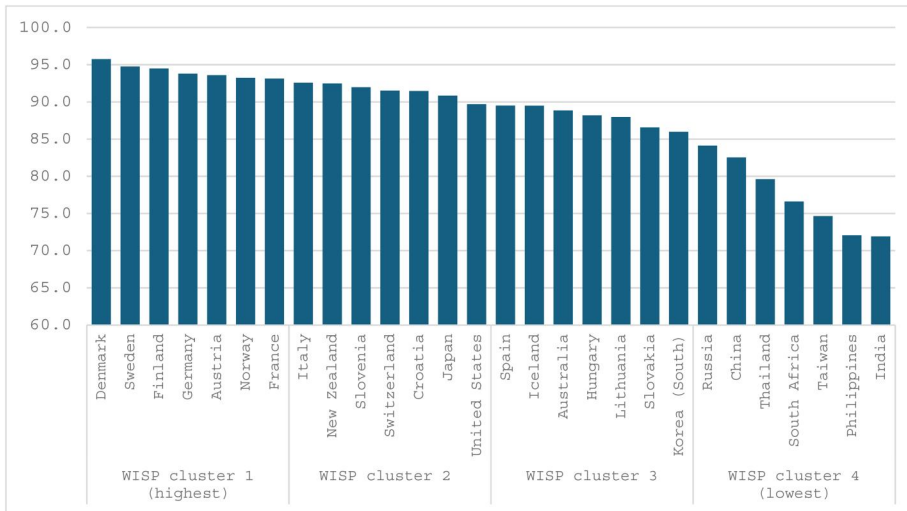


Figure 2. ISSP countries ranked according to their Weighted Index of Social Progress (WISP) 2020 score.

representation from North America, South America, Africa, Australia, Oceania, Asia, and Europe. This therefore offers an opportunity to study environmental behavior across different countries with different contexts. To determine how social progress impacts the pathways from environmental values to behaviors across different national contexts, country-level WISP 2020 scores were used.

The Weighted Index of Social Progress (WISP) is an index used to categorize countries into levels of social progress (Estes 2019). The WISP is a quality-of-life metric at the country level which uses more indicators than merely income. The WISP provides an overall composite score for each country (shown as an actual score varying from 0 to 100, ranks, and the standard deviation from the mean), and consists of 10 subdimensions, namely education, health, women's status, defence effort, economic, demography, environmental, social chaos, cultural cohesion, and welfare effort. In Figure 2 below, the countries included in this study are ranked by WISP 2020 score in descending order from highest to lowest. The four country clusters that were created for the purpose of this article are also displayed. The clusters were created by merely creating four equally sized clusters of seven countries each (see the Conclusion section for limitations to this clustering approach).

Dependent variable

Environmental behavior encompasses a wide array of actions aimed at promoting sustainability and protecting the environment. These actions range from personal efforts, such as recycling and conservation to more organized forms of engagement that hold political significance. Stern (2000) distinguishes between individual behaviors like recycling or conservation, which are part of everyday life, and environmental activism, which involves organized participation in environmental issues within formal institutional settings and often within political contexts. Environmental activism would include

activities, such as signing petitions, participating in protests, and joining social movements, highlighting its role as a pivotal component of broader environmental concern (Dunlap and Jones 2002).

The ISSP 2020 Environment module included items measuring individual behavior as well environmental activism. Two of these survey items focused on environmentally friendly behavior at home, including the frequency of making a “special effort to sort glass or tins or plastic or newspapers and so on for recycling” as well as avoiding the purchasing of environmentally unfriendly products. The answer categories in these cases were “always,” “often,” “sometimes,” and “never.” Other items in the module addressed membership of one or more environmental groups at the time of surveying, and actions taken in the last 5 years to protect the environment, including signing a petition about a green issue, donating money to an environmental group, and taking part in environmental protests. Responses to these items were captured using dichotomous “yes” and “no” options.

These variables were deemed broadly appropriate for the comparative examination of pro-environmental behavior, given that they provide for different types of environmental actions that are likely to apply to both low- and high-income countries. Yet, they are not without their limitations. For instance, Franzen and Vogl (2013, 51–52) flag potential challenges in developing pro-environmental behavior measures of this type in multinational, multiregional, and multicultural contexts. This is especially due to subjective interpretation, a tendency to reflect intentions rather than actual actions (as in the case of the phrasing “make a special effort” on the ISSP recycling item), in addition to infrastructure availability and cultural differences that may affect respondents’ ability to engage in environmentally friendly behavior. Environmental behaviors therefore differ and are often divided into two domains, namely public and private environmental actions (Hadler and Haller 2011). Signing petitions and participating in demonstrations are considered public actions, and this differs from routine behaviors such as recycling, which would be classified as private individual environmental actions. We acknowledge that the choice of measures could impact results, so we therefore ran separate modelling using only public action as a dependent variable measure as a robustness test. Apart from differences found among certain socio-demographic groups, the VBN results were similar in this public action modelling to those found in our blended public-private action model (results not shown). We therefore decided to remain with the full set of behavior items given that it provides for different types of environmental actions that are applicable to different societies. We have therefore opted to take a general approach to measuring the dependent variable, which is often argued as a better approach to measuring pro-environmental behavior (Kaiser, Wölfling, and Fuhrer 1999).

In creating a dependent variable measure of individuals’ pro-environmental behavior for use in this study, a multi-item index was constructed based on a combination of responses to the six questions outlined above, capturing various behavioral aspects (e.g., recycling, shopping, group membership, political actions). We first created dichotomous versions of the two recycling and environmentally conscious consumer choice items. In the case of recycling, a code of 1 was assigned to respondents answering that they “always” recycled (54 percent of the cross-national sample) and 0 otherwise. For environmentally friendly consumer choices, a code of 1 was given to respondents answering

that they “always” or “often” engaged in such behavior (39 percent of the cross-national sample) and 0 otherwise. The other four items were already dichotomously scaled, so “yes” responses were simply coded as 1, with “no” and item non-response codes given a value of 0. The resulting index was generated by averaging the six items together and transforming the measure into a 0 to 100 scale. The mean of the resultant behavior index is 23.19 ($SD = 21.88$, $CI: 22.98-23.39$).

In Table 1, descriptive statistics for each of the constituent indicators that formed the environmental behavior measure are presented, as well as the country scores based on the behavior index measure. The countries are ranked in descending order based on their aggregate environmental behavior index score. As can be observed, and perhaps as one might have expected, the degree of variance in pro-environmental behavior across countries on the six indicators and the aggregate index was pronounced, with a clear divide evident between developed and less developed countries. On average, European countries tended to exhibit higher levels of pro-environmental behavior compared to other world regions, with Switzerland, France, and Germany leading in many categories. Asian countries, like China, Japan, and South Korea, demonstrated lower levels of engagement; while developing nations, such as South Africa, Thailand, and Philippines, had the lowest scores with varying degrees of environmental action.

Interesting differences in mean scores for the behavioral items can be observed between the highest and lowest WISP country clusters. As is evident from the table, the largest difference in reported behavior between the lowest and highest WISP country clusters was in relation to recycling. In this instance, WISP Cluster 1 demonstrated the highest propensity for recycling, and was 52.5 percentage points higher compared to WISP Cluster 4 (75.2% versus 22.7% respectively).

Individuals in Cluster 1 and 2 exhibit a notably greater propensity to *boycott certain products* for environmental reasons compared to those in Cluster 3 and especially Cluster 4, with a substantial difference of 18.0 percentage points between Cluster 1 and Cluster 4. This finding is possibly influenced by disposable income which would therefore bias the score in favor of higher clusters (1–3) given that these countries would have greater disposable income. Looking at *membership of environmental groups*, it is evident that this action remains generally circumscribed, regardless of cluster classification. The difference in membership between clusters, and specifically between WISP Cluster 1 and 4, is therefore negligible. *Signing petitions* as a pro-environmental behavioral action is significantly less common in Cluster 4 countries. This seems reasonable given that higher-ranked WISP countries tend to have more active environmental movements and well-established advocacy organizations, which could encourage this form of environment engagement. In terms of *donating to environmental groups*, a higher WISP cluster ranking was associated with a greater tendency to undertake such action, which is unsurprising given that higher cluster countries tend to have more disposable income. Since high WISP cluster countries tend to have strong and well-established environmental groups and opportunities for grassroots activism, as well as vibrant civil society organizations, it is interesting to note that *protest action* across all clusters is circumscribed, with fairly insignificant observable differences between Cluster 1 and Cluster 4 on this measure. Finally, in terms of differences on the composite *environmental behavior index*, Cluster 1 surpasses Cluster 4 by a considerable margin of

Table 1. Pro-environmental behavior, by country.

	Always recycle (percent)	Often/always boycott buying certain products for environmental reasons (percent)	Member of group which aims is to preserve or protect the environment (percent)	Signed petition about environmental issue in last 5 years (percent)	Gave money to an environmental group in last 5 years (percent)	Took part in a protest/demonstration about an environmental issue in last 5 years (percent)	Environmental behavior index (mean, 0–100 score)
Switzerland	82.5	59.2	13.3	34.8	32.4	9.7	38.6
France	85.7	58.8	6.2	35.5	13.3	11.5	35.2
New Zealand	76.0	48.8	12.4	37.7	25.4	7.8	34.7
Germany	80.5	58.3	8.7	28.1	20.7	6.4	33.8
Austria	71.7	43.5	7.1	36.6	31.1	6.3	32.7
Australia	69.3	46.2	7.4	33.6	22.5	6.6	30.9
Iceland	72.5	36.2	11.7	29.6	22.4	6.1	29.7
Sweden	74.7	42.5	8.1	20.3	25.0	4.6	29.2
Norway	74.2	35.8	9.7	20.0	25.7	5.8	28.5
Slovenia	79.8	39.1	5.4	21.7	11.6	5.1	27.1
Denmark	65.5	40.2	10.2	17.4	17.5	6.3	26.2
Finland	69.4	37.7	6.5	20.6	18.2	3.5	26.0
Spain	61.5	42.5	3.5	25.4	9.5	11.6	25.7
Italy	81.9	32.2	5.3	13.8	8.1	5.6	24.5
United States	51.0	34.6	9.2	22.6	20.7	5.4	23.9
Japan	66.3	47.8	1.3	7.2	5.6	0.2	21.4
Taiwan	66.1	37.6	3.8	9.1	9.3	1.3	21.2
Slovakia	54.4	38.3	1.8	20.0	7.5	1.3	20.6
India	15.4	42.6	14.7	12.8	16.1	18.8	20.1
Croatia	36.1	30.0	3.2	15.0	5.7	3.6	15.6
Korea (South)	44.1	31.9	1.1	9.6	4.5	1.5	15.5
Hungary	42.4	30.6	1.9	6.1	5.2	2.2	14.7
Lithuania	47.1	19.9	2.0	12.1	3.2	2.1	14.4
Philippines	31.0	28.5	10.1	3.7	4.9	1.3	13.3
China	19.6	25.9	5.4	2.9	8.9	0.5	10.5
Thailand	13.4	29.6	2.5	6.1	7.3	3.1	10.3
Russia	15.2	23.0	2.7	9.7	7.0	2.1	10.0
South Africa	6.3	19.6	11.9	6.1	5.5	5.6	9.2
WISP Cluster 1 (highest)	75.2	46.3	8.0	25.7	21.6	6.4	30.5
WISP Cluster 2	70.8	46.1	8.7	24.8	20.1	6.3	29.5
WISP Cluster 3	56.7	35.9	4.2	20.3	10.6	5.4	22.2
WISP Cluster 4 (lowest)	22.7	28.3	7.4	6.7	8.2	4.2	12.9
Minimum value	6.3	19.6	1.1	2.9	3.2	0.2	9.2
Maximum value	85.7	59.2	14.7	37.7	32.4	18.8	38.6
Range	79.4	39.5	13.6	34.8	29.3	18.6	29.4

Note: Weighted data.

Source: ISSP Research Group (2023).

17.6, indicating a substantial disparity in overall pro-environmental behavior between the highest and lowest cluster countries.

Independent variables

In [Table 2](#), the indicators that were chosen as independent variables for the study, either as single-item measures or as items for multi-item index construction, are presented.

Previous research studies have shown that the reported impact of environmental problems on people's immediate surroundings and lives can shape their perceptions of environmental risk, attitudes, and concerns (e.g. [Whitmarsh 2008](#)). Impact was determined by asking respondents to what extent air pollution, water pollution, and extreme weather events had affected their lives in the past 12 months. Responses to the three items were averaged together and transformed into a 0–100 scale, forming an index of exposure to environmental problems at the neighborhood level, with a Cronbach's α reliability coefficient of 0.70. This question provides an indication of awareness of, and sensitivity to, local environmental issues.

Regarding environmental attitudes, the study made use of three items that [Franzen and Meyer \(2010\)](#) found to load onto a single factor using ISSP 1993 and 2000 data. Two of the items are affective in nature, focusing on an emotional concern about the quality of the environment. The third item is cognitive in character and addresses the influence that the economy has on environmental quality. All three items share the same positive phrasing and response scale. These questions have been used in a variety of publications, either as a combination of items or as single items ([Mayerl and Best 2018, 2019](#); [Hadler 2016, 2017](#); [Hadler et al. 2022](#)). In addition, these items were combined with a fourth item that relates to a sense of environment threat, with the item phrased “many of the claims about environmental threats are exaggerated” and answers captured using a standard 5-point agreement scale. Responses to the four items were averaged together and transformed into a 0–100 scale to form an index of exposure to environmental problems at the neighborhood level, with a Cronbach's α reliability coefficient of 0.69.

Environmental concern is one of the most widely identified factors that influences pro-environment behavior ([Wang, Hao, and Liu 2021](#)). The question used in this study to measure concern is an item that was introduced in the ISSP environmental module in 2010 and has since been widely used, especially in cross-national studies. This question is considered a reliable measure of general concern ([Dalton 2015](#)).

According to the VBN model, norms imply a sense of obligation to undertake pro-environmental actions ([Chen 2015](#)). In this study, five statements were used to measure environmental norms. Three of these focused on a willingness to undertake certain actions to protect the environment, i.e., paying much higher prices for pro-environmental goods, paying higher taxes, and accepting cuts in the standard of living to protect the environment). Although the authors acknowledge that these statements have a bias toward individuals and countries who have disposable income, these questions have been used in cross-national surveys, including the World Values Survey, ISSP, and the European Values Survey ([Franzen and Vogl 2013](#)). The questions were all positively phrased with identical scaling. The other two questions were attitudinal in nature and

Table 2. Specific items that measure exposure, concern, norms, and beliefs.

Construct	ISSP 2020 question	Response scale	Mean	SD
Exposure to environmental problems	Thinking about your neighborhood, to what extent, if at all, was it affected by the following things over the last twelve months? Air Pollution (Q22a)	1: Not at all 5: To a very great extent	2.17	1.07
	Water Pollution (Q22b)	1: Not at all 5: To a very great extent	1.92	1.06
Environmental attitudes	Extreme weather events (such as severe storms, droughts, floods, heat waves, cold snaps, etc.) (Q22c)	1: Not at all 5: To a very great extent	2.38	1.10
	Exposure to environmental problems index (0–100 scale)	0: Not at all 100: To a very great extent	27.00	21.25
	We worry too much about the future of the environment and not enough about prices and jobs today (Q10b)	1: Strongly agree 5: Strongly disagree	3.16	1.17
	People worry too much about human progress harming the environment (Q10d)	1: Strongly agree 5: Strongly disagree	3.20	1.11
	In order to protect the environment [COUNTRY] needs economic growth (Q10e)	1: Strongly agree 5: Strongly disagree	2.74	1.09
	Many of the claims about environmental threats are exaggerated (Q12e)	1: Strongly agree 5: Strongly disagree	3.40	1.14
	Environmental attitudes index (mean score, 0–100)	0: Weak pro-environmental attitude 100: Strong pro-environmental attitude	53.10	20.57
	Generally speaking, how concerned are you about environmental issues?	1: Not at all concerned 5: Very concerned	3.83	1.08
	How willing would you be to pay much higher prices in order to protect the environment?	1: Very willing 5: Very unwilling	3.09	1.19
	And how willing would you be to pay much higher taxes in order to protect the environment?	1: Very willing 5: Very unwilling	3.42	1.21
And how willing would you be to accept cuts in your standard of living in order to protect the environment?	1: Very willing 5: Very unwilling	3.05	1.20	
I do what is right for the environment, even when it costs more money or takes more time	1: Strongly agree 5: Strongly disagree	2.54	0.92	
There are more important things to do in life than protect the environment	1: Strongly agree 5: Strongly disagree	3.17	1.12	
Pro-environmental norms index (0–100)	0: Low pro-environmental norm 100: Strong pro-environmental norm	50.43	19.69	
Efficacy	It is just too difficult for someone like me to do much about the environment	1: Strongly agree 5: Strongly disagree	3.32	1.15
	There is no point in doing what I can for the environment unless others do the same	1: Strongly agree 5: Strongly disagree	3.21	1.24

have a long history of usage in cross-national studies both among OECD and non-OECD countries (Franzen 2003). The resultant norms index had a Cronbach's α reliability coefficient of 0.73.

For the efficacy beliefs domain, two statements were used measuring individual and social efficacy as per the VBN model (Stern et al. 1999). Individual efficacy refers to a belief in an ability to accomplish a task. People with strong personal efficacy regarding environmental issues feel empowered to act. Collective efficacy implies shared belief within a group or community that there is a capability to organize and execute actions effectively to achieve common goals.

Apart from these environmental measures, a modest set of personal socio-demographic measures were included that have proven significant in similar comparative environmental attitudes research, namely age (in years), gender, education level (0 to 7 based on increasing educational attainment categories), as well as an abbreviated Inglehart post-materialism scale (for more details see Inglehart 1977; Inglehart and Abramson 1999; Nawrotzki 2012).

In Table 3, the country distributions on the environmentally-focused independent variables are presented. For each indicator, the country mean score is presented. The countries are ranked in descending order based on the mean environmental behavior index scores that were presented in Table 1. The pattern of variation in the measures based on the four WISP country clusters are also shown.

Countries such as South Korea, Hungary, Russia, Croatia, and Slovakia exhibit high levels of exposure to environmental problems, in contrast with Sweden, Japan, and Denmark's lower exposure levels. France, Switzerland, Sweden, and Finland have the highest mean scores for environmental attitudes, while the Philippines, Slovakia, India, Thailand, and South Africa display comparatively lower scores. Spain ranks highest for environmental concern, whereas Slovakia ranks lowest. India tops the pro-environmental norms index, while Slovakia again shows lower adherence. Finland leads in both self and collective efficacy, indicating a strong belief in individual and community ability to effect environmental change, while India and Taiwan score lower on these measures.

When considering the WISP clusters, the only dimension where Cluster 1 scored lower than Cluster 4 was in relation to exposure to environmental problems. This suggests that countries in the lower clusters tend to have greater levels of exposure to environmental challenges, while those in Cluster 1 may be less exposed and possibly more resilient. In terms of environmental attitudes, Cluster 1 countries demonstrated more positive attitudes compared to Cluster 4, indicating a stronger inclination towards environmental conservation and awareness. Interestingly, environmental concern did not follow a linear pattern in terms of the higher cluster countries being more concerned. It was the second highest cluster that exhibited the highest levels of concern. These cluster countries therefore express slightly higher levels of concern for environmental issues thus implying a greater sense of worry or anxiety about environmental challenges. The difference in environmental concern between Clusters 1 and 4 was also minimal on average, indicating that most countries exhibit high levels of concern about environmental issues.

In terms of self-efficacy, the public in countries that scored high on the WISP index, typically higher income nations, tended to report a greater belief in their personal ability

Table 3. Measures of environmental exposure, attitudes concern, norms, and beliefs.

	Exposure to environmental problems index (mean, 0–100)	Environmental attitudes index (mean score, 0–100)	Environmental concern index (mean score, 0–100)	Self-efficacy (0–100)	Collective efficacy (0–100)	Pro-environmental norms index (mean, 0–100)
Switzerland	22.9	60.9	75.2	70.3	62.9	59.9
France	26.4	62.8	74.3	64.8	58.4	55.1
New Zealand	25.1	57.9	77.8	64.0	61.6	53.2
Germany	25.9	61.0	74.5	65.5	68.8	57.5
Austria	22.9	59.8	68.1	63.8	66.5	54.3
Australia	25.2	59.7	75.1	62.3	59.8	54.7
Iceland	23.8	59.1	70.0	65.1	66.0	53.6
Sweden	12.8	60.3	66.8	60.8	66.4	55.7
Norway	18.2	59.8	67.8	69.1	67.1	56.2
Slovenia	34.4	55.7	81.2	60.8	62.4	53.4
Denmark	15.3	58.9	68.8	61.1	60.1	55.1
Finland	19.8	60.4	66.9	71.2	71.2	49.2
Spain	33.9	53.5	81.8	67.6	54.3	45.0
Italy	28.7	53.7	77.0	61.2	58.8	46.3
United States	26.4	55.6	70.9	58.0	61.9	53.0
Japan	14.1	57.8	76.5	57.4	35.8	51.6
Taiwan	29.4	47.6	71.8	65.9	31.7	52.4
Slovakia	36.3	42.6	56.5	52.6	58.3	35.4
India	35.7	42.4	73.2	27.6	34.1	61.4
Croatia	36.4	50.7	67.8	60.2	62.4	37.3
Korea (South)	39.0	51.0	68.3	48.2	47.1	52.0
Hungary	38.9	49.9	66.2	49.6	62.2	41.5
Lithuania	24.2	50.0	69.7	42.3	60.8	39.3
Philippines	33.1	38.5	77.3	49.3	37.1	42.6
China	22.3	49.3	64.3	54.8	40.6	50.2
Thailand	27.1	42.2	57.5	50.3	50.8	39.7
Russia	37.0	43.8	75.3	46.1	65.7	40.2
South Africa	32.9	42.3	60.3	41.6	43.6	45.1
WISP Cluster 1 (highest)	20.2	60.5	69.8	64.8	65.5	54.9
WISP Cluster 2	25.3	57.4	75.0	63.6	58.8	53.4
WISP Cluster 3	31.7	52.5	71.4	56.8	57.7	46.1
WISP Cluster 4 (lowest)	30.4	44.2	67.4	48.5	43.0	47.3
Minimum value	12.8	38.5	56.5	27.6	31.7	35.4
Maximum value	39.0	62.8	81.8	71.2	71.2	61.4
Range	26.2	24.3	25.3	43.6	39.5	26.0

Note: Weighted data.

Source: ISSP Research Group (2023).

to make a positive impact on environmental issues. Given that pro-environmental norms and efficacy beliefs have a direct impact on environmental action and behavior, this finding is consistent with behavioral trends. Similarly, Cluster 1 shows higher collective efficacy compared to Cluster 4, indicating a stronger belief in the effectiveness of collective efforts to address environmental challenges. Furthermore, Cluster 1 demonstrates stronger pro-environmental norms than Cluster 4, reflecting a higher degree of societal expectation for environmentally responsible behavior among individuals in this cluster.

These differences underscore varying levels of environmental engagement and readiness to address environmental challenges across different clusters, with Cluster 1 generally exhibiting more positive attitudes and behaviors toward environmental conservation compared to Cluster 4. Having identified these differences at a bivariate level, a multivariate analysis is now undertaken to explore the associations between variables and assess whether the VBN model holds for all countries, determining which variables contribute most significantly to pro-environmental behavior

Results

Models examining the applicability of aspects of the VBN model

The first set of results determines whether the value-norms-behavior chain of sequence holds when controlling for the WISP country clusters. The OLS regression models consider the set of individual-level environmental variables that are thought to affect environmental behavior as per VBN theory, as well as a modest subset of personal attributes considered by Hadler (2016), namely age (in years), gender, education level (0–7 based on increasing educational attainment categories), geographic location, and the Inglehart post-materialism scale (Table 4). The modeling controls for differential levels of social progress between ISSP countries based on the aforementioned WISP 2020 clustering, using pooled data for all 28 nations that fielded and deposited data for the 2020 iteration of the ISSP Environment module (version 2-0-0).

In Model I, the focus is on the influence of environmental attitudes on environmental concern, controlling for other personal attributes. Among the variables in Model 1, the environmental attitudes index yields the strongest observed effect, suggesting that individuals who prioritize the environment and believe that the threat posed by environmental challenges are real, tend to exhibit higher levels of environmental concern. While socio-demographic factors and the postmaterialism index were all statistically significant, with higher concern registered among older, female, and better educated adults as well as those with postmaterialist values, the standardized coefficients were appreciably smaller relative to the environmental measures. The positive association between pro-environmental attitudes and environmental concern, controlling for WISP cluster, confirms hypothesis H1a.

In Models II and III, the predictors of pro-environmental norms are examined. Model II focuses on the effect of environmental concern, while Model III tests whether this effect holds true when exposure to environmental problems and pro-environmental attitudes are added. From the results in Model II, it is evident that, in line with theoretical expectations, environmental concern is a significant positive predictor of pro-environmental

Table 4. Linear OLS regression modeling of the determinants of pro-environmental concern, pro-environmental norms and pro-environmental behavior for countries clustered for level of social progress (WISP 2020).

	Model I	Model II	Model III	Model IV	Model V
	Env'tal concern	Index of pro-env'tal norms (0–100)	Index of pro-env'tal norms (0–100)	Index of pro-env'tal behavior (0–100)	Index of pro-env'tal behavior (0–100)
	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)
Age (in years)	0.1031***	0.0153**	0.0397***	0.0620***	0.0649***
Female	0.0523***	0.0180***	0.0022	0.0317***	0.0198***
Education level	0.0438***	0.0796***	0.0405***	0.0932***	0.0813***
Urban-rural location	0.0099*	0.0195***	0.0127**	-0.0251***	-0.0284***
Postmaterialist values (ref = materialist)					
Mixed	0.0113*	0.0540***	0.0467***	0.0369***	0.0369***
Postmaterialist	0.0205***	0.0861***	0.0670***	0.0812***	0.0771***
Environmental measures					
Self-efficacy belief: higher scores means greater rejection of the idea that "It is just too difficult for someone like me to do much about the environment"	...	...	...	0.1070***	0.0897***
Collective efficacy: higher scores mean greater rejection of idea that "There is no point in doing what I can for the environment unless others do the same"	...	...	...	0.0423***	0.0199***
Pro-environmental norm index: higher scores mean greater likelihood of prioritizing and willingness to sacrifice for the environment	...	...	...	0.3314***	0.2645***
Environmental concern: higher scores mean more concerned	...	0.3737***	0.2876***	...	0.1244
Environmental attitudes index: higher scores mean prioritize environment over worries about material issues	0.3117***	...	0.2818***	...	0.0635***
Exposure to environmental problems: higher scores mean more affected by environmental problems at neighborhood level	0.1432***	...	0.0211***	...	0.0648***
WISP 2020 country clusters (ref. = Cluster 1–highest)					
WISP Cluster 2	0.0996***	-0.0565***	-0.0365***	0.0052	-0.0140*
WISP Cluster 3	0.0511***	-0.1695***	-0.1322***	-0.0573***	-0.0828***
WISP Cluster 4 (lowest)	0.0810***	-0.1232***	-0.0361***	-0.2261***	-0.2398***
<i>N</i>	42,085	39,111	39,075	39,031	39,679
Adj <i>R</i> -squared	0.1411	0.1967	0.2579	0.2950	0.3192

Note: Weighted data. Significance is note as * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

Source: ISSP Research Group (2023).

norms. With the addition of environmental attitudes and exposure to environmental problems alongside concern as predictors of pro-environmental norms in Model III, the effect of concern remains unchanged (with a modest reduction in the standardized coefficient but the p-value remaining highly significant), while the environmental attitudes index emerges as an equally salient determinant of norms. In both models, postmaterialist values, educational attainment, age, and urban residence are positively associated with pro-environmental norms. The gender effect evident in Model II loses significance in Model III once the fuller environmental variable set was introduced. The direction and magnitude of the coefficients for these variables is generally consistent and does not have a particularly sizeable effect on post-environmental norms. These findings on the association between environmental concern and pro-environmental norms provide confirmatory evidence of hypothesis H1b.

Finally, in Models IV and V, the predictors of pro-environmental behavior are tested, with Model IV examining the influence of pro-environmental norms and efficacy beliefs, while Model V tests the full model by adding concern, attitudes, and exposure as independent variables. In Model IV, we find that the index of pro-environmental norms is positively associated with pro-environmental behavior, controlling for other factors, including country WISP score clusters, and displays the largest standardized β coefficient of all independent variables tested. The self- and collective efficacy beliefs items are also positively associated, with the former having a stronger standardized effect size on the behavioral outcome measure than the latter. This applies even when the models are rerun with self- and collective efficacy entered separately (results not shown). These findings are consistent with the VBN theoretical framework. What is interesting from Model V is that environmental concern has a significant positive association with pro-environmental behavior, even after controlling for pro-environmental norms and efficacy beliefs. The standardized β coefficient on this construct is stronger than for efficacy beliefs, suggesting that it continues to have a strong direct effect over and above its indirect influence on pro-environmental norms and efficacy beliefs. A similar finding is evident for environmental attitudes and exposure to localized environmental problems, with these variables having a significant direct effect on behavior in addition to their indirect influences on environmental concern, norms, and efficacy beliefs. The scale of this direct effect on behavior is nonetheless much lower than the effect on concern, norms, and efficacy beliefs.

In terms of personal socio-demographic traits, in both models age, gender, educational attainment, and rural-urban location were statistically significant predictors of personal pro-environmental behavior. On average, older, female, and more educated adults, along with those living in less urbanized areas, were more likely to engage in pro-environmental actions. The standardized coefficients for attitudes, exposure, and socio-demographics are distinctly smaller compared to those for pro-environmental norms and concern, suggesting that the latter remain the dominant influences. Those with a more postmaterial than material value orientation were more inclined to display pro-environmental behavior. Additionally, country cluster differences based on WISP scores also played a significant role in shaping pro-environmental behavior, with such action decreasing progressively from Clusters 2 through 4, relative to the highest cluster. The standardized β coefficient for the lowest WISP country cluster is one of the

strongest effects evident in the two models, pointing to a distinctively lower tendency to display pro-environmental behavior relative to the ISSP member countries with the highest WISP 2020 scores. The adjusted R-squared value of the model indicates that approximately a third of the variance in the pro-environmental behavior index is explained by the independent variables included in the models (29.5 percent in Model IV and 31.9 percent in Model V).

Both Models IV and V confirm hypothesis H1c, which expected a positive association between pro-environmental norms and efficacy beliefs on pro-environmental behavior, controlling for WISP clusters. Finally, from Models I, III, and V, it is evident that exposure to environmental problems had a significant positive effect on pro-environmental concern, norms as well as behavior. This applies after controlling for other personal attributes, environmental variables as well as WISP country clusters. This provides confirmation that hypothesis H1d holds true, namely that the lived experience of environmental problems shapes individual environmental concern, norms, and behavior.

From these modeling results, it is apparent the core tenets of the VBN theoretical framework apply to the ISSP 2020 comparative data, even when controlling for differences in level of social progress across the 28 nations represented. Environmental concern is informed by environmental attitudes and exposure to environmental problems, as well as personal socio-demographic and value orientations to a lesser degree. In turn, concern has a positive effect on pro-environmental norms and efficacy beliefs, which positively informs pro-environmental actions by extension. The more moderate direct effects of exposure, attitudes, and concern on behavior in addition to their indirect influences also need to be noted. From Models IV and V, it is also evident that countries falling in lower WISP clusters were significantly less likely to report pro-environmental behavior, especially for the cluster of countries with the lowest social progress. It is to this that we now direct attention.

Testing differences in the determinants of pro-environmental behavior for each WISP country cluster

Regression modeling often stops at this point and does not account for variation between country groups, such as WISP clusters. Therefore, in addition to the modeling presented in Table 4, which entered the country WISP score clusters as a control measure, we ran four separate models for each of the WISP clusters. This was done to examine consistency in the predictors of pro-environmental behaviors in line with the VBN model, as well as to determine the overall explanatory power of these independent variables (Table 5). The structure of the models is the same as the fully specified Model V in Table 4.

When considering the standardized β coefficients from the regression analysis for the different clusters, it is evident that there are significant associations between almost all independent variables tested and pro-environmental behavior across the WISP clusters. The magnitude and significance of these associations did however vary across clusters, suggesting nuanced differences in the determinants of pro-environmental behavior across different socio-cultural contexts. The environmental attitudes index exhibited mixed effects, with positive associations observed between the independent variables

Table 5. OLS regression model of the determinants of pro-environmental behavior for countries clustered for level of social progress (WISP 2020).

	Model I		Model II		Model III		Model IV	
	WISP Cluster 1 (highest)		WISP Cluster 2		WISP Cluster 3		WISP Cluster 4 (lowest)	
	B (sig.)	B (sig.)	B (sig.)	B (sig.)	B (sig.)	B (sig.)	B (sig.)	B (sig.)
DEPVAR = Index of pro-environmental behavior (0–100)								
Age (in years)	0.0555***	0.0864***	0.0782***	0.0453*				
Female	0.0222*	0.0074	0.0206*	0.0244**				
Education level	0.0862***	0.0887***	0.0828***	0.0778***				
Rural-urban location	–0.0049	–0.0416***	–0.0100	–0.0326***				
Postmaterialist values (ref = materialist)								
Mixed	0.0313*	0.0071	0.0717***	0.0539***				
Postmaterialist	0.1204***	0.0308**	0.1199***	0.0335***				
Environmental measures								
Self-efficacy belief: higher scores means greater rejection of the idea that “it is just too difficult for someone like me to do much about the environment”	0.0878***	0.0903***	0.1464***	0.0547***				
Collective efficacy: higher scores mean greater rejection of idea that “There is no point in doing what I can for the environment unless others do the same”	0.0392***	0.0328***	0.0603***	–0.0612***				
Pro-environmental norm index: higher scores mean greater likelihood of prioritizing and willingness to sacrifice for the environment	0.2432***	0.3250***	0.2418***	0.2348***				
Environmental concern: higher scores mean more concerned	0.1610***	0.0928***	0.1280***	0.1313***				
Environmental attitudes index: higher scores mean prioritize environment over worries about material issues	0.0526***	0.0743***	0.0656***	–0.0090				
Exposure to environmental problems: higher scores mean more affected by environmental problems at neighborhood level	0.0958***	0.0881***	0.0323**	0.0611***				
N	8,413	10,589	7,783	11,894				
Adj R-squared	0.2889	0.2850	0.2624	0.1067				

Note: Weighted data. Significance is note as * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$. Source: ISSP Research Group (2023).

and the dependent for WISP Clusters 1–3, but negative non-significant associations observed for WISP Cluster 4. This suggests that for this country grouping, environmental attitudes do not translate as effectively into behavior. Although this is surprising, scholars such as Heeren et al. (2016) and Wu and Mweemba (2010) have similarly found a disjuncture between environmental attitudes and pro-environmental behavior in some contexts. This provides inconsistent evidence for hypothesis H2a, which had expected a uniform positive association between environmental attitudes and behavior.

The effects of environmental concern and pro-environmental norms on pro-environmental behavior were both significant and positive regardless of the WISP country cluster, indicating a consistent influence. The results also showed that pro-environmental norms had the strongest direct effect on behavior across the clusters. This finding is in line with literature that suggests that pro-environmental norms are one of the predominant drivers of pro-environmental behavior (Farrow, Grolleau, and Ibanez 2017). The evidence therefore lends credence to hypotheses H2b and H2c regarding the effects of concern and norms on behavior

Self-efficacy beliefs were also consistently significant and positively associated with pro-environmental behavior across all four WISP clusters, indicating a clear influence on individuals' environmental actions regardless of cluster and controlling for other independent variables tested. In common with the environmental attitudes index, collective efficacy displayed inconsistent results. Again, a positive association was observed between this measure and behavior for WISP Clusters 1–3, with a significant inverse association in the case of WISP Cluster 4. This implies that, on average for the countries in WISP Cluster 4, individual pro-environmental actions are more likely to be considered futile unless others similarly engage in such behavior. By comparison, in WISP Clusters 1–3, individual pro-environmental behavior tends to be more common in cases where individuals believe that personal action will be impactful even if others do not follow suit. These findings from the models suggest that hypothesis H2d can be partially accepted given that self-efficacy beliefs have a uniform positive effect on behavior across WISP country clusters, but collective efficacy proved to be a less consistent predictor of behavior due to the lowest WISP cluster being an outlier.

The modeling also revealed that exposure to environmental problems had a significant positive effect on pro-environmental behavior, even when controlling for other environmental variables and socio-demographic traits. This evidence lends support to hypothesis H2e.

A notable general observation from an examination of the results of Models I–IV in Table 5 relates to the variation in Adjusted R-squared values across each WISP cluster. From this comparison, it is evident that the explanatory power of the regression models differs substantially across clusters. For the first three WISP country clusters, relatively high Adjusted R-squared values are noted (ranging from 0.2889 for the highest WISP cluster in Model I to 0.2624 for WISP cluster 3 in Model III), suggesting that the set of environmental, socio-demographic and postmaterialist values indicators included as independent variables explain a substantial portion of the variance in pro-environmental behavior, thereby indicating a strong fit of the model to the data. However, for the seven ISSP countries with the lowest WISP 2020 scores (Cluster 4) in Model IV, the Adjusted R-squared value is significantly lower (0.1067), implying a weaker association

between the predictors and the dependent variable. The observed variation in Adjusted R-squared values has implications for the degree of fit of the VBN model in understanding the drivers of pro-environmental behavior across different socio-cultural contexts. The clusters with higher R-squared values may indicate the presence of robust and consistent determinants of pro-environmental behavior considering the conceptual constructs associated with the VBN model within those contexts. Conversely, clusters with lower R-squared values may suggest greater heterogeneity or additional unaccounted factors influencing pro-environmental behavior.

A closer examination of pro-environmental action in ISSP countries with the lowest index of social progress scores

In a final analytical step, we conduct a more in-depth exploration of WISP Cluster 4 to determine if there are clear differences in the predictors of pro-environmental behavior between the countries falling within this cluster. While we acknowledge that it is possible that country-specific differences may also exist within Clusters 1, 2, and 3, examining these is beyond the scope of this paper. Overall, the lower Adjusted R-squared value, as well as the negative coefficients for collective efficacy and environmental attitudes in the modeling for WISP Cluster 4 in [Table 5](#), highlight the complexity of understanding pro-environmental behavior within different socio-cultural contexts. To better understand the complexities and differences in the different countries included in WISP Cluster 4, an analysis for each of the seven constituent countries was undertaken. In so doing, we again applied the same set of VBN-related hypotheses tested in the previous results section to the individual constituent countries within the cluster. Specifically, it was envisaged that pro-environmental behavior in each country would be positively influenced by environmental attitudes (H3a), environmental concern (H3b), pro-environmental norms (H3c), efficacy beliefs (H3d) and exposure to environmental problems (H3e). The regression results provide interesting insights into the determinants of pro-environmental behavior across the diverse set of countries included in Cluster 4, namely Russia, China, Thailand, South Africa, Taiwan, Philippines, and India ([Table 6](#)). In comparative analysis conducted to date using the ISSP Environment data, these countries tend to be underrepresented, with a greater tendency to focus on the more developed countries as case studies. This provides additional motivation to focus individually on WISP Cluster 4 countries.

With regard to the influence of environmental attitudes on behavior, a significant direct positive effect was only found in Thailand and India. In Thailand, the association was weakly positive. Yet, in the case of India, the association was strongly negative, with this predictor having the greatest bearing on environmental action of all the independent variables tested. This implies counter-intuitively that those who are more convinced of the primacy of the environment over other priorities in India are less likely to engage in pro-environmental behavior. This finding may reflect a concern with immediate economic imperatives alongside longer-term environmental considerations, as well as cultural and social norms that have a bearing on environment actions. Ultimately the finding suggests that a complex interplay of cultural, economic, and social factors may be shaping environmental attitudes and actions in India. These findings signify that

Table 6. OLS regression model of the determinants of pro-environmental behavior for specific countries within index of social progress cluster 4 (WISP 2020).

	Model I Russia	Model II China	Model III Thailand	Model IV South Africa	Model V Taiwan	Model VI Philippines	Model VII India
DEPVAR = Index of pro-environmental behavior (0–100)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)	<i>B</i> (sig.)
Age (in years)	–0.0146	0.0346	0.0105	0.0523**	0.1284***	0.1189**	–0.0815***
Female	0.0515	–0.0229	0.0190	–0.0018	0.1381***	–0.0196	0.0636*
Education level	–0.0211	0.0662**	0.1252***	0.0866***	0.2322***	0.0700*	–0.0062
Urban-rural location	–0.0169	...	–0.0369	–0.0155	–0.0310	–0.0389	–0.0209
Postmaterialist values (ref = materialist)							
Mixed	0.0210	0.0162	0.0671	0.0302	0.0069	0.0168	0.0533
Postmaterialist	0.0511	0.0381	0.0441	0.0031	0.0115	0.0184	0.0912**
Environmental measures							
Self-efficacy belief: higher scores means greater rejection of the idea that “It is just too difficult for someone like me to do much about the environment”	0.0874**	0.0367	–0.0043	0.0684**	0.1009***	–0.0194	–0.1928***
Collective efficacy: higher scores mean greater rejection of idea that “There is no point in doing what I can for the environment unless others do the same”	0.0162	–0.0228	–0.0129	–0.0796***	–0.0003	0.0416	0.1108***
Pro-environmental norm index: higher scores mean greater likelihood of prioritizing and willingness to sacrifice for the environment	0.2130***	0.1919***	0.1392***	0.2812***	0.1437***	0.0870**	0.0508
Environmental concern: higher scores mean more concerned	0.1052***	0.1488***	0.0921**	0.0941***	0.1784***	0.1138***	0.0884**
Environmental attitudes index: higher scores mean prioritize environment over worries about material issues	–0.0441	0.0058	0.0735*	0.0225	0.0130	–0.0226	–0.2546***
Exposure to environmental problems: higher scores mean more affected by environmental problems at neighborhood level	0.0659*	0.0066	0.1673***	0.0822***	0.0359	0.0399	0.0461
<i>N</i>	1,429	2,387	1,202	2,646	1,704	1,392	1,134
Adj. <i>R</i> -squared	0.0941	0.0888	0.1033	0.1237	0.1704	0.0291	0.1163

Note: Weighted data. Significance is note as * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

Source: ISSP Research Group (2023).

hypothesis H3a is not supported based on individual testing of the countries included in WISP Cluster 4.

Environmental concern emerged as a consistent and strong predictor of pro-environmental behavior in all WISP Cluster 4 countries. This finding underscores the universal importance of individuals' concern for the environment in directly driving pro-environmental behavior in these countries, in addition to its indirect influence through pro-environmental norms and efficacy beliefs. This confirms hypothesis H3b on the positive association between environmental concern and pro-environmental behavior at a country level within the lowest WISP score cluster.

Pro-environmental norms, which include prioritizing the environment and a willingness to sacrifice for it, proved to be a significant determinant of pro-environmental behavior in all countries except India. In Russia, China, and South Africa, norms had the strongest bearing on pro-environmental behavior among all the environmental measures tested. This suggests that hypothesis H3c largely holds true for the countries in WISP Cluster 4, with pro-environmental norms positively predicting pro-environmental behavior in all except for India.

Self-efficacy emerged as a significant predictor of pro-environmental behavior in South Africa, Taiwan, India, and Russia. However, it was not significant in the Philippines, Thailand, and China. This measure was a particularly strong predictor in the cases of Taiwan ($\beta = 0.1009$, $p < 0.001$) and India ($\beta = -0.1894$, $p < 0.001$), where its impact was pronounced, but in opposite directions. In Taiwan, self-efficacy, or the belief that individual action can make a difference to the environment, was a positive driver of pro-environmental behavior. This positive association was also evident in Russia and South Africa, but the size of the association is smaller. Conversely, in India, the notion that it was very difficult for individual actions to make a difference in protecting the environment appeared to positively affect pro-environmental behavior. These mixed findings show that there is only weak or partial support for hypothesis H3d within WISP Cluster 4, with only three of the seven countries conforming to the expected relationship.

Collective efficacy was a significant predictor in only two of the seven countries, namely South Africa and India. Collective efficacy displayed a significant negative relationship with environmental behavior in South Africa ($\beta = -0.0796$, $p < 0.001$) but a positive relationship in India ($\beta = 0.1108$, $p < 0.01$), suggesting that collective efficacy influences individuals' actions differently across these two contexts. In South Africa, a belief that collective environmental action was necessary for individual action to matter exerted a pull-down effect on pro-environmental behavior. The opposite was true for India, where collective action was not seen as a prerequisite for individual action. This part of the analysis reaffirms the message that there is limited support for hypothesis H3d on the relationship between efficacy beliefs and behavior in the individual countries falling in WISP Cluster 4.

The influence of exposure to environmental problems varied across countries. Exposure to environmental problems had a very strong and positive influence on pro-environmental behavior in Thailand and South Africa. This effect was however only weakly positive in Russia, and not significant in any of the other countries. This discrepancy is interesting given that these WISP Cluster 4 countries are more likely to be

exposed to the impact of environmental problems due to national disaster risk management resource constraints. Yet, the results reveal that such problems did not universally encourage pro-environmental behavior, suggesting that the impact of exposure on behavior may be shaped by unique contextual factors in each country. This finding shows that hypothesis H3e has variable application to the seven countries included in the lowest WISP cluster.

Finally, it can be observed that the Adjusted R-squared values of the models for the WISP Cluster 4 countries differ substantially, which highlights variation in the explanatory power of the regression models across these countries. South Africa and Taiwan exhibit relatively higher Adjusted R-squared values (0.1237 and 0.1704, respectively), indicating a better fit of the models to the data and suggesting that the included predictors explain a larger proportion of the variance in pro-environmental behavior. By contrast, other countries, such as the Philippines display a lower Adjusted R-squared value (0.0291), suggesting a weaker association between the predictors and the dependent variable.

Conclusion

In this study, an attempt has been made to provide greater insight into the nature and relative strength of the determinants of pro-environmental behavior across a diverse global context, as delineated by a clustering of weighted index of social progress (WISP) scores for the 28 countries included in the 2020 round of the ISSP Environment module. By examining the influence of key psychological, social, and contextual factors on pro-environmental behavior, the study contributes to a more nuanced understanding of the predictors of environmental behavior, especially among less developed countries that rank relatively low on the WISP measure. The initial regression modeling, which included WISP clusters as a fixed effect, showed that the value-belief-norm (VBN) theoretical model had general applicability across the ISSP countries. However, this approach tended to obscure differences that exist between country clusters. This implies that important inter-cluster variations could go unnoticed, which might be to the detriment of policy design and interventions directed at promoting personal pro-environmental behavior within various national settings.

The second regression approach employed in the paper therefore modeled each WISP cluster separately. In this instance, the results indicated that there are certain consistent determinants of pro-environmental behavior across all four designated WISP clusters, such as self-efficacy belief, pro-environmental norms, environmental concern, and exposure to environmental problems, although the magnitude and significance of these associations differed between the clusters. Variations in Adjusted R-squared values across each of the four WISP clusters highlighted the heterogeneity in the explanatory power of the predictors. In WISP Cluster 4, which comprised typically poorer and non-western nations, the analysis showed that the explanatory power of the VBN model on pro-environmental behavior was significantly lower than countries falling in higher WISP clusters. This finding needs to be further investigated to determine which variables could be added to theoretical models, such as the VBN, to account for the unexplained variance in countries with lower social progress, and further refine the

conceptual framework used to represent the determinants of pro-environmental behavior in these generally under-researched settings.

When comparing the applicability of the VBN model across WISP clusters, the expected associations between environmental attitudes, concern, norms, and pro-environmental behavior were validated for WISP country Clusters 1–3. However, in WISP country Cluster 4, a lack of significant association between environmental attitudes and pro-environmental behavior was found, while a negative association was observed for collective efficacy. This contradicts the expected positive relationship between these variables and pro-environmental behavior. Other studies have also found non-significant and weak relationships between attitudes and pro-environmental behavior (Heeren et al. 2016; Wu and Mweemba 2010). One explanation is that individuals in these countries, despite holding positive environmental attitudes, may feel that they lack the opportunities or resources to act on them. Additionally, there may be insufficient social or cultural support, or infra-structural challenges that hinder their efforts (Miller et al. 2022). A possible interpretation of the negative association between collective efficacy and pro-environmental behavior in the case of WISP Cluster 4 is that environmental challenges may be perceived as insurmountable in the absence of sufficient collective action to address these issues effectively. This could signal that cultural or contextual factors are at play, with collectivism being seen as more important than individual action in promoting environmental behavior. It is also interesting to note that despite the frequently reported experience of environmental challenges in the lowest WISP cluster (relative to WISP clusters 1 and 2), this did not lead to a significantly higher level of effect on pro-environmental behavior.

By modeling each WISP cluster separately, differences between the four country clusters became more apparent, although this approach still masked some of the individual country variations in the determinants of pro-environmental behavior that existed within each cluster. Recognizing this, the final modeling approach in the article thus focused on intra-cluster differences, using WISP Cluster 4 as a case study. The results revealed clear variation in the predictors of pro-environmental behavior between countries within this cluster. This indicates that clustering countries based solely on their level of social progress for analytical purposes may miss out on distinctive patterns at the country level.

The findings in this paper underscore the importance of considering socio-cultural context in understanding and promoting pro-environmental behavior. The applicability of VBN theory in various contexts can differ significantly, especially when applied to diverse cultural, social, and institutional environments. When adapting this theory to different settings, it is crucial to consider how contextual factors may influence the relationships between values, beliefs, and norms that guide environmental behavior. While certain psychological and social factors, such as self-efficacy beliefs and pro-environmental norms, appear generally influential, their effectiveness may be moderated by contextual factors across countries with varying levels of social progress. These findings highlight the need for tailored interventions that account for the unique and often complex socio-cultural dynamics of countries to progressively and effectively promote pro-environmental behavior worldwide.

What do these results imply for comparative survey research? The analysis suggests that clustering countries based on a particular social indicator assumes a degree of within-cluster homogeneity that may lead to an incomplete or partial understanding of

the drivers of social phenomena, such as personal pro-environmental action. To avoid obscuring salient country-level insight, it is important for analysts in future to examine both between- and within-cluster variation to gain a fuller picture of the dynamics at play, while also exploring the potential application of other methods. An example would be to make use of random slopes in multilevel modeling, as was done by Penker (2024) in this journal using ISSP Environment module data. This approach allows the effect of predictors on a dependent variable to vary between clusters or countries and could generate a more nuanced understanding of how variables function across diverse settings and provide richer insight into cross-national comparisons.

Limitations of the study

The findings of this article suggest that, while there is variation in the determinants of pro-environmental behavior between WISP clusters, significant differences also exist within countries. This was illustrated by the degree of variation in the applicability of the VBN model found among individual countries in WISP Cluster 4. Such intra-cluster variation will inevitably raise questions about the utility of clustering countries based on WISP to examine cross-national determinants of pro-environmental behavior. Clustering countries based on their level of social progress offers a useful framework for simplifying and contextualizing cross-national comparisons of pro-environmental behavior, but the intra-cluster variation can pose challenges. This approach assists in identifying broad trends and patterns but may be less effective for understanding country-specific determinants and tailoring policy interventions accordingly. Some caution should therefore be exercised in interpreting results from the clustered analysis. It should be complemented with a more granular, country-specific analysis to capture the full complexity of pro-environmental behavior across diverse national contexts.

In this article, the approach that was used to classify countries into WISP clusters was based on a rank ordering of countries based on their WISP score, followed by a simple assigning of the 28 ISSP countries represented in the dataset into quartiles of seven countries each. Therefore, use was not made of particular WISP score thresholds and ranges in determining this classification. Other researchers may wish to test the robustness of our findings when applying other clustering approaches.

As detailed in the methodology section, a composite index of pro-environmental behavior was constructed as a dependent variable for the analysis in the article by combining various behavioral items, encompassing both private and public actions. Although the literature has shown that these two domains of behavior vary in nature and may be influenced by different factors, the decision was ultimately made to retain the full set of behaviors to ensure a more comprehensive analysis across diverse societies. However, recognizing the potential impact of focusing solely on one domain, we conducted a robustness test by running a model using only public actions as the dependent variable. The results showed that the conclusions remained consistent, whether the index included both public and private actions or was confined to public actions alone. Further work could nonetheless be undertaken to examine the applicability of the VBN theoretical model to individual behavioral actions using the cross-national data, as well as different combinations of the behavioral measures.

The data used in the analysis is cross-sectional in nature, which presents certain limitations. A study of this type would benefit immensely from longitudinal data, which would enable researchers to explore social progress over time and its impact on environmentalism. Additionally, it is important to acknowledge that some variables used in the study may be influenced by social desirability bias, potentially leading to an overestimation of pro-environmental commitment.

Policy implications

The study findings suggest that policymakers should consider socio-cultural context when designing and implementing strategies to promote pro-environmental behavior. For countries in lower WISP clusters, particularly those in WISP Cluster 4, policymakers should focus on initiatives that enhance collective action and address the perception that individual efforts are futile, while also factoring in unique country-level predictors of pro-environmental behavior.

Future research

From this paper, it is evident that this field of study would benefit from research that identifies additional variables that can be integrated into existing models, such as the VBN framework, to better capture the factors influencing pro-environmental behavior in countries where the VBN model has been shown to be less predictive of pro-environmental behavior. Additionally, as has been stated before, it would be interesting to undertake a study of this nature using longitudinal data to determine how social progress impacts the different components of pro-environmental behavior.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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