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Historical Ecospirituality and Environmental Attitudes

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Historical Ecospirituality and Environmental Attitudes[★]

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This paper studies ecospirituality - spiritual views that people have about the natural world. First, utilizing folklore data from around 1,000 pre-industrial societies, we present the first comprehensive global measurement of ecospirituality. Our analysis reveals systematic cultural variation: ecospirituality is most prevalent in South America and least prevalent in Europe. Additionally, we find a strong negative correlation between ecospirituality and belief in high gods. Second, we study the potential impact of historical ecospirituality on current environmental attitudes. Combining data from the Integrated Values Survey with folklore, we find no statistically significant relationship between contemporary environmental attitudes and the prevalence of ecospirituality in the folklore of ones ancestors. **JEL Codes: Q50, Z12, Z13**

Keywords: Environmental Attitudes, Ecospirituality, Folklore

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1 Introduction

Social scientists have long observed a connection between people’s spiritual beliefs and their perceptions of the natural world (Cohen et al., 1976; Eliade, 2022). People from many cultures around the world engage in nature worship, view the natural world as reflecting a spiritual reality or believe that it is inhabited by spiritual beings like water spirits or nature deities.

Despite this widespread phenomenon, existing literature on these beliefs primarily consists of qualitative case studies that focus on one specific culture and study its spiritual beliefs about nature (Bhagwat and Rutte, 2006; Kent, 2009; Carroll, 2020). Although recent studies in social psychology have begun to examine spiritual beliefs about nature more systematically (Billet et al., 2023), many important questions remain open: How universal are spiritual views of nature? To what extent do they vary across cultures, and what factors drive these differences? Furthermore, can spiritual beliefs about nature that are deeply rooted in a nation’s culture help to understand global differences in contemporary environmental attitudes?

This paper aims to make progress towards answering these questions by studying ecospirituality. Ecospirituality describes the spirituality surrounding nature, including the experience and appreciation of nature’s spiritual characteristics (Billet et al., 2023). Our study of ecospirituality proceeds in two parts. First, drawing on folklore from around 1,000 pre-industrial societies, we present the first global measure of ecospirituality. Second, based on hypotheses from anthropology and social psychology (Kaufman and Mock, 2014; Suganthi, 2019), we use our measure to investigate whether ecospirituality can help to predict global variation in contemporary environmental attitudes.

While ecospirituality has been studied in many contexts separately, there is so far no global and quantitative measure of ecospirituality. In the first part of the paper, we therefore develop such a measure and investigate its correlation with other historical and geographical variables. To capture cultural expressions of ecospirituality, we draw on historical sources of collective belief. In particular, we use Berezkin’s Folklore and Mythology Catalog (Berezkin, 2015) — a collection of oral traditions and folklore summarized into over 2,000 motifs, where a motif represents an episode found in two or more different traditions. This catalog was introduced to economics by Michalopoulos and Xue (2021), who classify these motifs based on their content. For instance, to find origins of risk attitudes, they look for motifs which mention challenges and competitions. Similarly, we employ artificial intelligence to classify Berezkin’s motifs according to the spiritual views of nature that they express. Specifically, a motif is classified as ecospiritual if nature is described in a spiritual way or if nature is attributed with moral values.

This procedure enables us to provide the first global measure of ecospirituality. We find that ecospirituality varies significantly across regions and countries. In

particular, ecospirituality is lowest in Europe and highest in South America. Furthermore, we find a negative correlation between ecospirituality and beliefs in a high god. This suggests substitutability between believing in a supreme deity that created the natural world and belief in spiritual entities that inhabit/are reflected in the natural world.

In a second step, we link our ecospirituality measure to contemporary environmental attitudes. A growing literature in economics has shown that many social attitudes have deep roots in a population's cultural history (Alesina, Giuliano, and Nunn, 2013; Cao et al., 2021). Following this strand of literature and building on the literature on ecospirituality from anthropology, we test the hypothesis that deeply-rooted cultural beliefs about the natural world influence environmental attitudes. Using a measure of environmental attitudes from the Integrated Values Survey (IVS), we are unable to find a statistically significant relationship between ancestral ecospirituality in folklore and individual environmental attitudes. This result is robust to a variety of different measures of environmental attitudes and different sets of control variables.

Our paper contributes to several strands of literature. First, it advances the interdisciplinary study of ecospirituality. While anthropologists have examined ecospirituality qualitatively for decades, the concept has recently gained attention in social psychology. For instance, Billet et al. (2023) use survey data from four countries to measure ecospirituality among contemporary populations. We expand this research by providing — to the best of our knowledge — the first global and quantitative measurement of ecospirituality. Further, given that ecospirituality is often described as deeply rooted in a society's cultural beliefs, the focus on folklore from ancient societies seems advantageous to measuring it in contemporary surveys. By discovering meaningful global differences in ecospirituality and linking them to contemporary environmental attitudes, this paper therefore enhances our knowledge of an important concept in social science.

Second, this paper adds to the literature on (global) differences in environmental attitudes and their determinants. In the context of global environmental dangers, researchers are increasingly focusing on understanding individuals' environmental attitudes and their impact on behavior (Hurst et al., 2013; Liu, Teng, and Han, 2020; Wyss, Knoch, and Berger, 2022). Recently, a lot of effort has been put into measuring global differences in environmental attitudes (e.g. Li et al. (2018), Dechezleprêtre et al. (2022), and Andre et al. (2024)). Those studies repeatedly find significant differences in environmental values across countries. For instance, Li et al. (2018) find that Latin American countries display stronger environmental attitudes yet score lower in terms of environmental protection actions. Further, Andre et al. (2024) show that people in countries that face vulnerability to climate change exhibit a particularly strong willingness to contribute to fighting climate change. However, while these studies reveal significant cultural variation in environmental attitudes, little is known about the origin of this variation. Some stud-

ies suggest that pro-environmental attitudes might be influenced by cultural differences (Chwialkowska, Bhatti, and Glowik, 2020; Khan, Varaksina, and Hinterhuber, 2024; Yang et al., 2024; Tam, 2025).

Furthermore, some studies directly investigate the role of spirituality and religion in shaping environmental attitudes. These studies provide mixed evidence. For instance, Zemo and Nigus (2021) find that religiosity encourages financial contributions and lessens participation in protests for environmental protection. Similarly, Wojcik (2023) find that individuals affiliated with a religious denomination tend to report lower pro-environmental attitudes than those without such affiliation. At the same time, greater personal religiosity and active participation in religious practices are associated with more pro-environmental attitudes, though both effects are modest.¹ We build on this literature by studying the role of ecospirituality, a specific form of spirituality that directly relates to nature, in shaping environmental attitudes.

Finally, our paper adds to the literature on deep cultural roots of economic attitudes. Most of this literature focuses on the origins of other social attitudes, for instance gender norms (Alesina, Giuliano, and Nunn, 2013), negative reciprocity (Cao et al., 2021) or cooperation (Enke, 2019). This paper contributes to this literature by studying deep cultural roots of an economic attitude that has important implications in the fight against climate change.

The remainder of the paper is organized in two parts: First, Section 2 provides a detailed descriptive study of ecospirituality. We develop a global measure of ecospirituality using folklore from around the world and then use this measure to investigate the global distribution of ecospirituality as well as its relationship with other cultural variables. Second, Section 3 studies the relationship between ecospirituality and contemporary environmental attitudes. Both sections are structured similarly: We first describe the data and methodology. Then we present and discuss the results. Finally, Section 4 concludes the paper.

2 A Global Measure of Ecospirituality

Ecospirituality is studied in different fields of ecology, anthropology, psychology, religion, and their combinations (Delaney, 2005; Kaufman and Mock, 2014; Suganthi, 2019; Billet et al., 2023). It describes the spirituality surrounding nature, encompassing the experience and appreciation of nature’s spiritual characteristics. Two accessory themes within ecospirituality are its focus: connectedness to nature and the tendency to give nature anthropomorphic qualities. The former highlights the profound bond humans might feel with the natural world, while the latter involves

1. Additional studies examining the relationship between religion and environmental attitudes include Sharma, Ang, and Fredriksson (2021) and Shah and Asghar (2024).

attributing human-like traits and emotions to natural elements, enhancing the spiritual connection with nature (Billet et al., 2023). Examples of ecospirituality can be found in various religious and spiritual practices, such as natural sacred sites, like sacred groves in Hinduism (Bhagwat and Rutte, 2006; Kent, 2009), or animistic indigenous beliefs, like the Grizzly Bear Spirit inhabiting the Rocky Mountains in the K'tunaxa worldview (Carroll, 2020).

This section presents the first part of our analysis of ecospirituality where we develop a global measure of ecospirituality and study its correlation with other cultural and geographical variables.

2.1 Data and Methodology

2.1.1 Berezkin's Folklore and Mythology Catalog.

Ecospirituality is understood as a worldview that emerges from and is sustained by a society's cultural and spiritual belief systems (Suganthi, 2019; Lestar and Böhm, 2020). It is therefore reasonable to measure ecospirituality using cultural elements that have been passed down through generations. Folklore and oral traditions are ideally suited for this purpose, as they often contain narratives and motifs that reflect a society's relationship with nature and the spiritual significance attributed to it. Additionally, folklore is often preserved over long periods of time and can provide insights into historical cultural values.

Based on this reasoning, we employ Berezkin's Folklore and Mythology Catalog (Berezkin, 2015) to develop a measurement of ecospirituality. This catalog offers a comprehensive comparative perspective on oral traditions worldwide. Encompassing 958 prehistoric ethnic groups across the globe, folklorist Yuri Berezkin has developed a unique database for mythology and folklore. According to Michalopoulos and Xue (2021) the catalog version we use covers over 85% of the oral traditions for groups in Africa, Asia, and Oceania and is completed for groups in Europe and North and South America.²

Out of the 958 groups, Berezkin has identified and categorized 2,564 motifs. A motif represents a combination of images, episodes, or structural elements present in two or more texts. For instance, the motif that is represented in most groups (355) is the following: "Father or other kinsmen of hero's wife or bride try to kill or test him and/or suggest him difficult tasks". To construct the motifs, he consulted over 6,000 books and journal articles from all over the world in over 30 languages and published mostly in the 19th and 20th century (Berezkin, 2015).

Michalopoulos and Xue (2021) validate Berezkin's Folklore and Mythology Catalog by showing that the motifs reflect their geographic and social attributes. For instance, groups living in proximity to earthquake-prone areas have a higher

2. Figure A.1 in the appendix shows the geographical distribution of the groups.

prevalence of earthquake themed motifs. We use the folklore motifs provided by Michalopoulos and Xue (2021), which is Berezkin’s catalog version from October 2019. Additionally, this dataset provides a mapping of Berezkin’s motifs to the pre-historic *Ethnographic Atlas* (EA) groups introduced by Murdock (1962). Thus, we can use the folklore of 1,245 prehistoric ethnic groups (EA-groups) for our analysis.

2.1.2 Classification.

In order to measure ecospirituality in folklore, we employ artificial intelligence, particularly the GPT-4 model from OpenAI. The model is pre-trained on large amounts of text data and therefore well-equipped for text classification (Baktash and Dawodi, 2023).

Based on the survey measurement of Billet et al. (2023), we develop the following classification scheme: A motif is classified as being ecospiritual if there is a perceived spiritual connection between humans and the natural environment, an acknowledgment of the sacredness or inherent value of nature, any mention of nature deities, nature as a spiritual resource or source of nourishment, or if nature has supernatural elements or attributes in the motif.³ An example of such a motif would be: “The sky (the Sun, the Thunder, the Wind that lives in the sky) is considered a man and marries a female Earth; The sky combines with the Water Woman; with the daughter of Earth; the creator (master) of heaven and the creator (owner) of the earth — husband and wife; seldom: the sky-woman combines with the earth-man”.

Each motif is classified individually. The prompts are structured as follows: First, instructions are given on what to look out for in the motif. Next, the specific motif is presented. Then the classification question is asked and lastly, we give the model the possible answers, to keep the answer predictions short. The whole classification was done twice by the GPT-4 model to ensure that the results are not only consistent but also reproducible, as model outputs can exhibit some degree of randomness. Overall, the classifications were consistent for over 97% of the motifs. In the rare cases where both classification runs did not agree, we manually classified the motifs to account for any potential variability in the model’s output.

In addition to the ecospirituality classification, we also classify all motifs based on whether they include nature in any form. Motifs about just humans themselves were not classified as nature. In total, 1,920 (74,9%) of the motifs include nature and 383 (15%) of all motifs, 20% of all nature motifs, were classified as ecospiritual.

Based on these classifications, we construct the following measurement for ecospirituality, where g is the EA-group for which ecospirituality is measured.

$$Ecospirituality_g = \frac{\text{Number of motifs including ecospirituality}_g}{\text{Number of motifs about nature}_g} \quad (1)$$

3. For a detailed description of the prompt see Section A.2 in the appendix.

2.1.3 Regression.

Additionally, we are interested in the relationship between ecospirituality and other historical cultural variables from the Ethnographic Atlas. Such an analysis can provide insights into the cultural and social factors that have historically influenced ecospiritual beliefs.

We estimate the following regression model:

$$Ecospirituality_g = \beta_0 + \beta * EA_variable_g + \alpha * Baseline\ Controls_g + \delta_c + \epsilon_g \quad (2)$$

where $Ecospirituality_g$ is the share of ecospirituality-motifs of all motifs including nature in the folklore of a group (see Equation 1), $EA_variable_g$ is a variable from the Ethnographic Atlas and δ_c are continent fixed effects. Additionally, following Michalopoulos and Xue (2021), we control for the number of publications used by Berezkin in the collection of his catalog and the year of the first publication for a group.

We are interested in the relationship of ecospirituality and historic EA variables. In particular, we focus on two variables: belief in a high god and dependence on agriculture. A high god is defined as “a spiritual being who is believed to have created all reality and/or to be its ultimate governor, even if his sole act was to create other spirits who, in turn, created or control the natural world” (Murdock, 1962). We hypothesize that this is negatively correlated with ecospirituality. While in traditional monotheism nature is the creation of God and God therefore exists outside creation, ecospiritual beliefs often emphasize a spiritual reality within the natural world. Second, we measure the dependence on agriculture using the EA variable *subsistence economy agriculture*. This variable is defined as “dependence on agriculture, relative to other subsistence activities” (Murdock, 1962). These include gathering, hunting, fishing, and animal husbandry. We hypothesize that dependence on agriculture is positively correlated with ecospirituality, as agriculture comes with a particular dependence on nature.

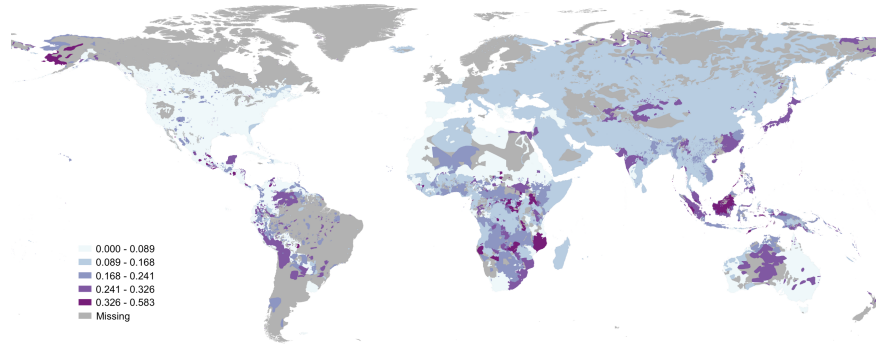
2.2 Results

We begin by characterizing our ecospirituality measure. Using folklore we can assign an ecospirituality score to 1,245 prehistoric Ethnographic Atlas (EA) groups. Across this sample the measure has a mean of 0.18 (SD = 0.08) and ranges from 0 to 0.58.⁴

We proceed to describe the spatial distribution of ecospirituality. To match the EA-groups to locations, we use the database constructed by Giuliano and Nunn (2018), which uses the *Ethnologue* (Gordon, 2009) to map languages and their current geographic distribution to one of the ethnic groups from the EA.

4. The full distribution is shown in the appendix Figure A.2 and Figure A.3.

Figure 1 shows the worldwide distribution of ecospirituality using the measurement of Equation 1, divided into quintiles. There is notable variation in ecospirituality across regions. Ecospirituality is most prevalent in Southern Africa, South America, South East Asia and Oceania, while it is less common in the Middle East, Northern Africa and Europe.⁵ Column 1 in Table 1 presents regression results with Europe as a reference category and shows that the difference in ecospirituality between Europe and other continent is statistically significant.



Notes. The map shows the worldwide distribution of ecospirituality (on EA-group level) using the measurement of Equation 1, divided into quintiles.

Figure 1. Ecospirituality Worldwide

Overall, our results provide a significant finding for the literature on ecospirituality, highlighting meaningful differences on a global scale and suggesting that cultural and historical contexts play a crucial role in shaping ecospiritual beliefs.

Finally, we investigate the relationship between ecospirituality and other historic cultural variables from the Ethnographic Atlas with the help of Equation 2. Columns 2 and 3 in Table 1 present the results of the regressions of high gods and subsistence economy agriculture on ecospirituality.

Belief in high gods is negatively correlated with ecospirituality. The effect is statistically significant at the 1% level. Our result points to a substitution effect between the belief in a high god who created the natural world and is therefore outside of nature and ecospiritual beliefs that emphasize a spiritual reality within nature.

The level of dependence on agriculture is positively correlated with ecospirituality, though the effect is only statistically significant at the 10% level. This provides some — though ultimately inconclusive — evidence that ecospiritual beliefs are related to the economic dependence on nature.

5. See Table A.1 in the appendix for the continent means.

	Ecospirituality		
	(1)	(2)	(3)
High gods		−0.012*** (0.004)	
Subsistence: Agriculture			0.003* (0.001)
Africa	0.039*** (0.011)	0.023** (0.011)	0.039*** (0.011)
Asia	0.078*** (0.012)	0.052*** (0.014)	0.078*** (0.012)
North America	0.093*** (0.012)	0.073*** (0.015)	0.102*** (0.012)
Oceania	0.090*** (0.013)	0.056*** (0.018)	0.092*** (0.013)
South America	0.112*** (0.013)	0.087*** (0.018)	0.116*** (0.014)
Year of first publication	0.683* (0.399)	0.605 (0.450)	0.598 (0.390)
Number of publications	0.00001 (0.006)	0.002 (0.006)	−0.002 (0.006)
R-squared	0.122	0.164	0.127
Observations	1,245	738	1,244
R ²	0.122	0.164	0.127
Adjusted R ²	0.117	0.155	0.121

Notes. The Table reports the OLS estimates of [Equation 2](#). Europe is the reference category for the continent dummies. Column 1 shows the baseline regression without any cultural variables, column 2 includes belief in high gods as a regressor, and column 3 includes dependence on agriculture. Standard errors, clustered at the country level, are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table 1. Results of Estimations of [Equation 2](#)

3 Ecospirituality and Contemporary Environmental Attitudes

Anthropologists and social psychologists have suggested that ecospirituality might enhance pro-environmental attitudes (Kaufman and Mock, 2014; Suganthi, 2019; Billet et al., 2023). Based on our global measure of ecospirituality developed in [Section 2](#), we analyze in this section whether historical ecospirituality affects contemporary environmental attitudes. To do so, we combine our ecospirituality measure with individual-level data from the World Values Survey (WVS) and the European Values Study (EVS).

3.1 Data and Methodology

Both WVS and EVS examine social, political, economic, religious, and cultural values worldwide. Together, they encompass 118 countries. We use the Integrated Values Survey (IVS) to measure contemporary environmental attitudes, which contains all waves of World Values Survey (WVS) and the European Values Study (EVS).⁶

The Surveys contains multiple questions that are broadly related to environmental attitudes. We use only variables that have been asked in the most recent wave of the WVS (wave 7) and are therefore available for a large number of countries. This leaves us with four variables: (1) A dummy that indicates whether one is member of an environmental organization (2) A dummy indicating which of the following statements is closer to ones views: *A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.* (3) Confidence in the environmental protection movement. (4) A variable indicating whether one names making cities/countryside more beautiful as an important goal for ones country. Using these variables, we construct an environmental attitude index as the first principal component of the four variables.⁷ Additionally, we also analyze each of the four variables separately as robustness checks.

Following Giuliano and Nunn (2018, 2021), we match individuals from the IVS to EA-groups using linguistic information.⁸ In a first step, Giuliano and Nunn (2018) manually linked EA-groups to modern-day language regions in the Ethnologue database (Gordon, 2009). Building on this mapping, we assign each individual in the IVS to an EA-group according to the language spoken at home and the individual's country of residence. This allows us to consistently assign each individual an ecospirituality value. The underlying assumption in this matching is that

6. Data drawn from Haerpfer et al. (2020) and EVS (2022).

7. For the exact descriptions as well as the factor loadings see [Figure A.4](#) in the appendix.

8. We thank Nathan Nunn for generously sharing his data.

the language currently spoken in a region serves as a proxy for the ethnic identity and ancestry of its inhabitants. This approach is widely applied in the literature on the deep cultural roots of economic attitudes (Alesina, Giuliano, and Nunn, 2013; Giuliano and Nunn, 2018; Cao et al., 2021; Giuliano and Nunn, 2021).

To test the hypothesis that historical ecospirituality affects contemporary environmental attitudes, we estimate the following regression model:

$$Env. Attitude_i = \beta_0 + \beta * Ecospirituality_g + \gamma * Baseline Controls_i + \alpha_{c,w} + \epsilon_i \quad (3)$$

where $Env. Attitude_i$ is the individual i 's environmental attitude measured as the constructed index and $Ecospirituality_g$ is our ecospirituality measure. The individual controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity.⁹ We also include country-wave fixed effects $\alpha_{c,w}$ to account for time-invariant country characteristics as well as global shocks that affect all countries in a given wave. Standard errors are clustered at the language level to account for arbitrary correlation of the error terms within EA-groups.

One potential concern is that not all EA-groups are equally represented in the sample (see Figure A.5). To avoid that our results are driven by a few groups with many observations, we use inverse probability weights. That is, each observation is weighted by the inverse of the share of one's EA-group among all individuals, making sure that groups with many observations do not receive more weight. We use this weighting scheme in all regressions with the exception of a robustness check (see Section 3.3). The robustness check shows that our main results are insensitive to the use of these weights.

3.2 Results

Table 2 presents the results of Equation 3. Columns 1 and 2 show the results for both WVS and EVS, without and with individual controls. Columns 3 and 4 contain results for the same regression but only use the WVS. We are unable to find a significant relationship between ecospirituality and contemporary environmental attitudes. If anything, the relationship is negative, but the effect is small and not statistically significant.

Therefore, we cannot confirm the hypothesis from anthropology and social psychology that ecospirituality enhances pro-environmental attitudes.

9. A detailed summary statistics table of all used variables is provided in Table A.2 in the appendix.

	WVS and EVS		WVS only	
	Pro-environment Index (1)	Pro-environment Index (2)	Pro-environment Index (3)	Pro-environment Index (4)
Ecospirituality	-0.086 (0.075)	-0.022 (0.072)	-0.087 (0.075)	-0.022 (0.072)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	297,402	257,237	251,398	217,763
Clusters	311	306	303	298
R ²	0.168	0.156	0.168	0.157
Mean of dep. var.	0.374	0.376	0.381	0.383
Standard deviation of dep. var.	0.192	0.192	0.195	0.194

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The Pro-environment index is constructed as the first principal component from a factor analysis of four variables: *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4), and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. Observations are weighted with the aforementioned weighting scheme. The independent variable is the share of all ecospirituality motifs in all motifs of a group. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table 2. Main Results: Ecospirituality and Pro-Environmental Attitudes

3.3 Discussion and Robustness

To check the robustness of our results, we perform several additional tests.

While matching individuals to their ethnic group via the spoken language is a common approach in the literature, it is not without measurement error. One potential concern is that, particularly in the Americas and Oceania, many individuals speak colonial languages such as English or Spanish while still maintaining strong connections to their indigenous cultural heritage. To address this, we run a robustness check excluding those observations for which this might be the case. Here we make use of the broad ethnicity variable in the WVS and exclude all individuals from the Americas and Oceania who do not identify their ethnicity as “White”.¹⁰ Table A.3 presents the results of this robustness check. As in the main results, we do not find a significant effect of historical ecospirituality on contemporary environmental attitudes.

Another potential issue is the different number of observations per EA-group. As shown in Figure A.5, a few ethnic groups have a very large number of observations, while many groups have only a few observations. As argued above, we use inverse probability weights to avoid that our results are driven mainly by the few groups with many observation. To test for robustness, we run two robustness checks

10. Note that while this variable is useful for identifying people with potential indigenous background it is not fine-grained enough to match an individual to a specific ethnic group.

that further address this issue. First, we run the regressions without the weighting scheme. Second, we exclude all observations from groups with only with less than ten observations. As can be seen in [Table A.4](#) and [Table A.5](#), the results remain stable in both cases.

We also test for robustness with regard to the measurement of environmental attitudes. As mentioned above, we use all environment-related variables that have been asked in the last wave of the WVS and build an environmental attitude index. [Tables A.6 – A.9](#) in the appendix present the separate results for the four variables. Again, we find no effect of historical ecospirituality on any of the four variables.

Additionally, we test for robustness with regard to the ecospirituality measure. As mentioned in [Equation 1](#), in our main specification, we divide the number of ecospirituality-motifs by the number of all motifs including nature. If the number of motifs about nature is higher for cases with higher ecospirituality, this would compress the distribution of the ecospirituality measure, biasing the empirical analysis against finding significant results. To test for this, we run the same regression with an alternative measure of ecospirituality where we divide the number of ecospirituality motifs by the the total number of all motifs (also those without nature). Results are shown in [Table A.10](#) and similar to the main results.

Finally, it might be possible that the country-wave fixed effects in our main regression absorb positive correlation between ecospirituality and environmental attitudes. To test for this, we run a regression without country-wave fixed effects and only include wave fixed effects. Results are shown in [Table A.11](#) and again similar to the main results.

The fact that we do not find a significant effect of historical ecospirituality on contemporary environmental attitudes in any of our robustness checks strengthens our conclusion that — if there is a relationship between the two — it is more complex than often assumed in the literature from anthropology and social psychology.

4 Conclusion

This paper studies ecospirituality — spiritual views that people have about the natural world. We analyze ecospirituality in two parts. First, by using data from folklore of around 1000 pre-industrial societies, we provide the first global measurement of ecospirituality. We find significant differences in the prevalence of ecospirituality across cultures. Societies in South America, Southern Africa, South-East Asia and Oceania display the highest levels of ecospirituality, while societies in the Middle East, Northern Africa and Europe have lower levels. Additionally, we find that ecospirituality is significantly negatively correlated with the belief in high gods. This suggests that the belief in a high gods and ecospirituality are substitutes in the spiritual beliefs of societies.

Second, we test the hypothesis that deep-rooted ecospiritual beliefs affect contemporary environmental attitudes. We link data from the Integrated Values Survey to our historical ecospirituality measure and find no statistically significant relationship between contemporary environmental attitudes and ecospirituality. This is robust to a variety of specifications, including different measures of environmental attitudes and ecospirituality. It is the nature of null results that we cannot conclude that there is absolutely no relationship between ecospirituality and environmental attitudes. However, we view our result as a first step of better understanding spiritual views about nature. If there is a relationship between ecospirituality and environmental attitudes, this relationship is more complex than what might be hypothesized from the literature. Further research is necessary to uncover such a relationship.

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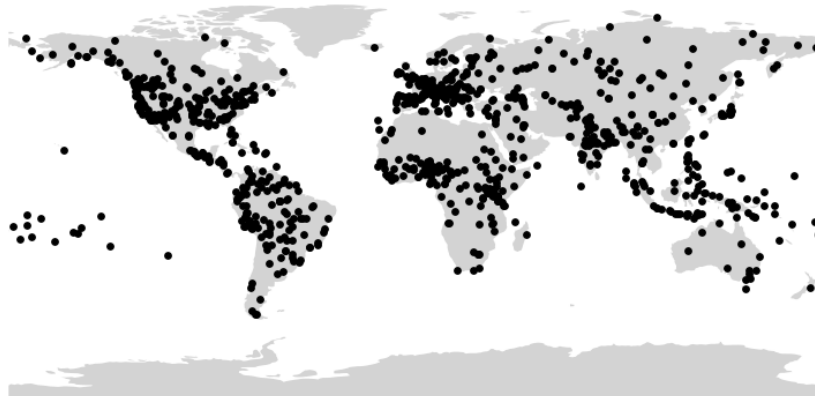
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Appendix A

A.1 Folklore Groups



Notes. The map shows the geographical distribution of the 958 prehistoric ethnic groups from which Yuri Berezkin collected folklore and mythology for his catalog.

Figure A.1. Geographical Distribution of Berezkin's Groups

A.2 Prompt Example

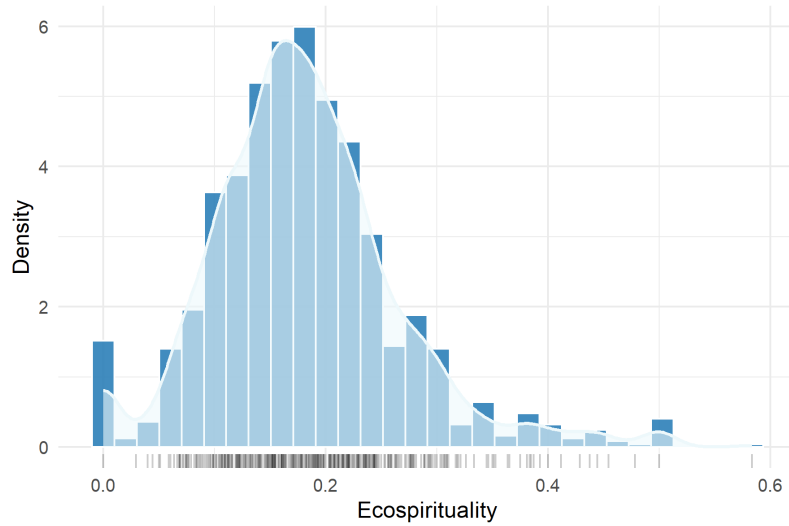
The following is an example prompt for the classification of ecospirituality:

Instruction: Look for themes or mentions within the text that reflect nature in a spiritual way. In particular look for: a perceived spiritual connection between humans and the natural environment or within the natural world, an acknowledgment of the sacredness or inherent value of nature, any mention of nature deities, nature as a spiritual resource or source of nourishment, nature having supernatural elements or attributes. All of this classifies as the text including elements of ecospirituality. The motif doesn't include ecospirituality measurements if nature has human attributes, but no additional spiritual or supernatural elements are mentioned.

Text: The sky (the Sun, the Thunder, the Wind that lives in the sky) is considered a man and marries a female Earth; The sky combines with the Water Woman; with the daughter of Earth; the creator (master) of heaven and the creator (owner) of the earth - husband and wife; seldom: the sky-woman combines with the earth-man
Question: Answer the following question about the text: Does the text include elements of ecospirituality?

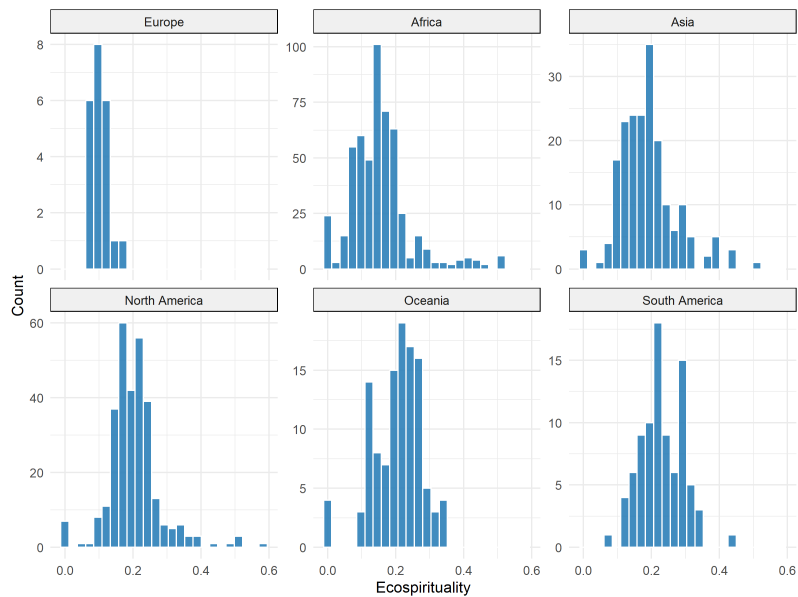
Answers: Yes (1), No(0)

A.3 Distributions of Ecospirituality



Notes. The histogram shows the distribution of ecospirituality for 1,245 prehistoric EA-groups.

Figure A.2. Distribution of Ecospirituality



Notes. The histogram shows the distribution of ecospirituality for 1,245 prehistoric EA-groups by continent.

Figure A.3. Distribution of Ecospirituality by Continent

Continent	Mean Ecospirituality
Europe	0.102
Africa	0.154
Asia	0.189
North America	0.205
Oceania	0.204
South America	0.231

Table A.1. Mean Ecospirituality by Continent

A.4 Environmental Attitudes Index

- *Member of environmental group (=1)*. 1 if belongs to organization related to “conservation, the environment, ecology, animal rights” and 0 otherwise. [A071¹] Please look carefully at the following list of voluntary organisations and activities and say... which, if any, do you belong to?
- *Environment higher priority than economic growth (=1)*. 1 = agreement and 0 = disagreement. [B008] Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own point of view? A. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. B. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent.
- *Confidence in environmental protection movement (1-4)*. Constructed using two variables. (i) For all waves except EVS wave 1, E069_14 is used. 1 = None at all, 2 = Not very much, 3 = Quite a lot, 4 = A great deal. [E069_14] I am going to name a number of organizations. For [The Environmental Protection Movement], could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? (ii) For EVS wave 1, E104 is used instead. 1 = Strongly disapprove, 2 = Somewhat disapprove, 3 = Somewhat approve, 4 = Strongly approve. [E104] There are a number of groups and movements looking for public support. For [Ecology movement or nature protection], can you tell me whether you approve or disapprove of this movement?
- *Aim of country: Make cities/countryside more beautiful (0-2)*. 2 = mentioned as first choice, 1 = mentioned as second choice, 0 = not mentioned at all. [E001, E002] People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important?

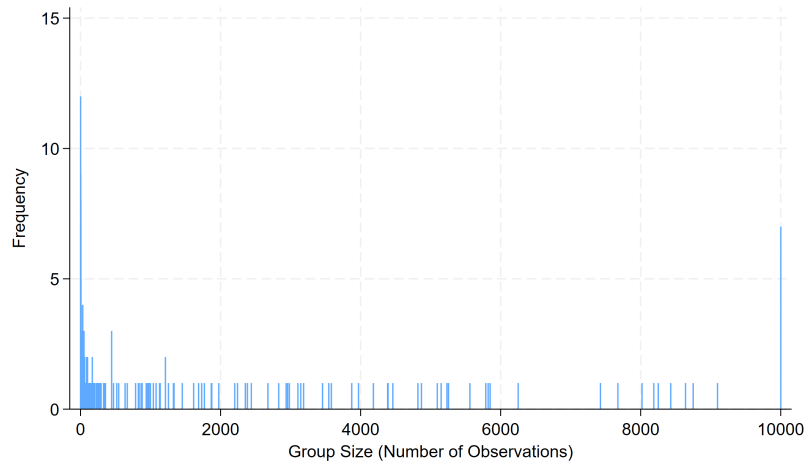
Table 1: PCA Factor Loadings for Pro-Environment Index

Index	Variable	PC1	PC2
Pro-environment index (WVS and EVS)	Member of environmental group (=1)	0.429	-0.577
	Environment higher priority than economic growth (=1)	0.567	0.247
	Confidence in environmental protection movement (1-4)	0.614	-0.241
	Aim of country: Make cities/countryside more beautiful (0-2) ^a	0.345	0.741
Pro-environment index (WVS only)	Member of environmental group (=1)	0.410	-0.626
	Environment higher priority than economic growth (=1)	0.575	0.278
	Confidence in environmental protection movement (1-4)	0.622	-0.222
	Aim of country: Make cities/countryside more beautiful (0-2) ^a	0.338	0.694

^a Coded as 0 if not mentioned, 1 if mentioned as second choice and 2 if mentioned as first choice.

Figure A.4. Variable Description and Factor Loadings for the Environmental Attitude Index

A.5 EA-Group Sizes



Notes. The histogram shows the distribution of the number of observations per EA-group in the IVS data. The maximum number of observations per group is capped at 10,000 for better visibility. There are seven EA-groups with more than 10,000 observations. Two of them have more than 20,000 observations (Serbs and Russians), Spaniards has about 52,000 observations and Dutch has about 73,000 observations. The mean number of observations per group is 2,054, the median is 103.

Figure A.5. Distribution of EA-Group Sizes in the IVS Data

A.6 Summary Statistics

	mean	sd	min	p25	p50	p75	max	count
Pro-environment index	.374	.192	0	.247	.371	.48	1	297403
Pro-environment index (WVS)	.381	.195	0	.252	.378	.476	1	251399
Ecospirituality	.123	.0631	0	.0766	.11	.153	0	297403
Age	42.7	16.7	15	29	40	55	102	296853
Age squared	2105	1578	225	841	1600	3025	10404	296853
Female	.517	.5	0	0	1	1	1	297232
Married	.62	.485	0	0	1	1	1	296606
Number of children	1.71	1.49	0	0	2	3	5	291577
Employed	.556	.497	0	0	1	1	1	292058
Education level	2.07	.732	1	2	2	3	3	295580
Income level	4.85	2.32	1	3	5	6	10	277924
Religious	.581	.493	0	0	1	1	1	287706
Observations	297403							

Notes. The table shows summary statistics for the variables used in Table 2. Only observations with non-missing values for ecospirituality and the Pro-environment index are included. The Pro-environment index is constructed as the first principal component from a factor analysis of four variables: *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4), and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. It is calculated for all waves of the IVS and for the WVS only. Ecospirituality is our independent variable and all other variables listed are control variables.

Table A.2. Summary Statistics

A.7 Robustness Checks

	WVS and EVS		WVS only	
	Pro-environment Index (1)	Pro-environment Index (2)	Pro-environment Index (3)	Pro-environment Index (4)
Ecospirituality	-0.098 (0.075)	-0.043 (0.072)	-0.099 (0.075)	-0.043 (0.072)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	263,416	226,856	217,412	187,382
Clusters	305	301	297	293
R ²	0.174	0.168	0.174	0.169
Mean of dep. var.	0.374	0.375	0.380	0.381
Standard deviation of dep. var.	0.192	0.191	0.194	0.193

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level and religiosity. The Pro-environment index is constructed as the first principal component from a factor analysis of four variables: *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4), and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. Observations are weighted with the aforementioned weighting scheme. Individuals from the Americas and Oceania who don't identify as "White" are excluded. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.3. Excluding Non-Whites from the Americas and Oceania

	WVS and EVS		WVS only	
	Pro-environment index (1)	Pro-environment index (2)	Pro-environment index (3)	Pro-environment index (4)
Ecospirituality	-0.049 (0.036)	-0.036 (0.040)	-0.052 (0.036)	-0.038 (0.039)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	297,402	265,598	251,398	226,124
Clusters	311	307	303	299
R ²	0.110	0.118	0.112	0.119
Mean of dep. var.	0.374	0.375	0.381	0.381
Standard deviation of dep. var.	0.192	0.192	0.195	0.194

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, and income level. Pro-environment index is created using the first principal component from the factor analysis of four variables, namely, *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4) and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.4. No Inverse Probability Weighting

	WVS and EVS		WVS only	
	Pro-environment Index (1)	Pro-environment Index (2)	Pro-environment Index (3)	Pro-environment Index (4)
Ecospirituality	-0.026 (0.045)	-0.024 (0.047)	-0.030 (0.045)	-0.026 (0.047)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	297,252	257,112	251,248	217,638
Clusters	267	266	259	258
R ²	0.141	0.151	0.141	0.151
Mean of dep. var.	0.374	0.376	0.381	0.383
Standard deviation of dep. var.	0.192	0.192	0.195	0.194

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The Pro-environment index is constructed as the first principal component from a factor analysis of four variables: *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4), and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. Observations are weighted with the aforementioned weighting scheme. Only observations from EA-groups with at least 10 observations are included. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.5. Excluding Small EA-groups

	WVS and EVS		WVS only	
	Environment Priority Over Growth (1)	Environment Priority Over Growth (2)	Environment Priority Over Growth (3)	Environment Priority Over Growth (4)
Ecospirituality	-0.160 (0.198)	-0.097 (0.188)	-0.161 (0.198)	-0.096 (0.188)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	347,361	295,444	296,963	252,575
Clusters	315	309	307	301
R ²	0.130	0.130	0.127	0.127
Mean of dep. var.	0.559	0.560	0.548	0.549
Standard deviation of dep. var.	0.497	0.496	0.498	0.498

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The outcome is a dummy indicating that an respondent gives priority to protecting the environment over economic growth. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.6. Priority to Environment over Economic Growth and Ecospirituality

	WVS and EVS		WVS only	
	Confidence in Environmental Movement (1)	Confidence in Environmental Movement (2)	Confidence in Environmental Movement (3)	Confidence in Environmental Movement (4)
Ecospirituality	-0.315 (0.231)	-0.161 (0.215)	-0.304 (0.231)	-0.154 (0.215)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	413,471	348,092	301,500	257,795
Clusters	320	313	308	301
R ²	0.141	0.158	0.143	0.160
Mean of dep. var.	2.594	2.597	2.618	2.627
Standard deviation of dep. var.	0.867	0.864	0.882	0.879

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The outcome is a variable (1-4) indicating an respondents confidence in the environmental protection movement. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.7. Confidence in Environmental Protection Movement and Ecospirituality

	WVS and EVS		WVS only	
	Member of Environmental Group (1)	Member of Environmental Group (2)	Member of Environmental Group (3)	Member of Environmental Group (4)
Ecospirituality	0.006 (0.157)	-0.059 (0.170)	0.006 (0.156)	-0.058 (0.169)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	442,653	367,319	319,146	268,363
Clusters	316	310	304	298
R ²	0.157	0.158	0.158	0.158
Mean of dep. var.	0.100	0.104	0.116	0.120
Standard deviation of dep. var.	0.300	0.305	0.321	0.325

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The outcome is a dummy indicating membership in an environmental group. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.8. Membership in Environmental Group and Ecospirituality

	WVS and EVS		WVS only	
	Aim: Make Country More Beautiful (1)	Aim: Make Country More Beautiful (2)	Aim: Make Country More Beautiful (3)	Aim: Make Country More Beautiful (4)
Ecospirituality	-0.350 (0.219)	-0.019 (0.201)	-0.348 (0.219)	-0.017 (0.201)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	383,499	321,382	326,039	274,899
Clusters	316	309	308	301
R ²	0.113	0.147	0.113	0.148
Mean of dep. var.	0.356	0.357	0.353	0.353
Standard deviation of dep. var.	0.613	0.614	0.611	0.611

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The outcome is a variable (0-2) indicating whether an respondent mentions making cities/countryside more beautiful as a preferred aim of the country. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.9. Beauty of Cities/Countryside as Aim and Ecospirituality

	WVS and EVS		WVS only	
	Pro-environment Index (1)	Pro-environment Index (2)	Pro-environment Index (3)	Pro-environment Index (4)
Ecospirituality	-0.084 (0.079)	-0.013 (0.074)	-0.085 (0.079)	-0.013 (0.073)
Demographic controls	No	Yes	No	Yes
Country-wave fixed effects	Yes	Yes	Yes	Yes
Observations	297,402	257,237	251,398	217,763
Clusters	311	306	303	298
R ²	0.168	0.156	0.168	0.157
Mean of dep. var.	0.374	0.376	0.381	0.383
Standard deviation of dep. var.	0.192	0.192	0.195	0.194

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. The Pro-environment index is constructed as the first principal component from a factor analysis of four variables: *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4), and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. The independent variable is calculated as the number of ecospirituality motifs divided by the total number of motifs in a language. Observations are weighted with the aforementioned weighting scheme. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.10. Using Total Number of Motifs as Denominator

	WVS and EVS		WVS only	
	Pro-environment Index (1)	Pro-environment Index (2)	Pro-environment Index (3)	Pro-environment Index (4)
Ecospirituality	-0.031 (0.074)	-0.010 (0.069)	-0.044 (0.075)	-0.017 (0.070)
Demographic controls	No	Yes	No	Yes
Wave fixed effects	Yes	Yes	Yes	Yes
Observations	297,403	257,238	251,399	217,764
Clusters	311	306	303	298
R ²	0.004	0.015	0.006	0.015
Mean of dep. var.	0.374	0.376	0.381	0.383
Standard deviation of dep. var.	0.192	0.192	0.195	0.194

Notes. The table reports OLS estimates where the unit of observation is an individual. Demographic controls include age, age squared, gender, marital status, number of children, employment status, education level, income level, and religiosity. Compared to our main specification, country-wave fixed effects are replaced by wave fixed effects only. The Pro-environment index is constructed as the first principal component from a factor analysis of four variables: *Member of environmental group* (=1), *Environment higher priority than economic growth* (=1), *Confidence in environmental protection movement* (1–4), and *Aim of country: Make cities/countryside more beautiful* (0–2). The index is normalized to range from 0 to 1. The independent variable is calculated as the number of ecospirituality motifs divided by the total number of motifs in a language. Observations are weighted with the aforementioned weighting scheme. Standard errors clustered at the level of language are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.

Table A.11. No Country Fixed Effects