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Egoism Can Be Green: Personal Values and Likelihood of Engaging in Pro-Environmental Behavior in Undergraduate Students in Nepal and the USA

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Abstract

Studies exploring personal values and environmental behaviors have established that biospheric values are positively associated with pro-environmental behaviors, while egoistic values are negatively associated. However, no studies have assessed this relationship in Nepal, a developing country in the Global South. In this study, we explore personal value structure and value–behavior relationships in undergraduate student samples from Nepal (N = 142) and the USA (N = 90) separately. We assessed the factor structure of the personal value orientations in both samples using exploratory factor analysis (EFA). We found no distinction between biospheric and altruistic values in the Nepali sample, but we did in the US sample. Within each sample, we tested whether value endorsement explains reported likelihood of engaging in pro-environmental behaviors (L-PEB). In the US sample, biospheric values were associated with greater public L-PEB, and in the Nepali sample, both biospheric-altruistic values and egoistic values were positively associated with public L-PEB. These findings reveal distinct patterns in the organization of personal values across two samples and suggest egoistic values may not inhibit pro-environmental behavior in some cultural contexts.

Keywords: pro-environmental behavior; personal value orientation; path analysis; exploratory factor analysis; cultural differences

1. Introduction

Several environmental conditions, such as biodiversity loss, extreme weather events, and climate change, are worsening every year. Structural factors like institutions, economic systems, public policies, and social norms are known to contribute to these issues. Along with this, individual values and behavior are important factors to consider because promoting environmental conservation requires a change in the lifestyle choices and behavior of billions of people across the globe [1]. Moreover, being able to intervene and change these individual factors can collectively affect structural factors that ultimately affect environmental conditions [2]. Thus, it is important to understand the psychological factors that lead to pro-environmental behaviors across cultural and global contexts.

While there are many psychological roots of pro-environmental behavior, we focus on the role of personal values. Values are particularly important because, unlike attitudes and beliefs, which vary within an individual across specific contexts and often change in response to new information, values are relatively stable across both time and culture [3,4].

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Further, individual actions taken in pursuit of these stable and domain-general personal values have social consequences. While research on the relationship between personal values and pro-environmental behavior is well-developed, it is mainly conducted in Europe, North America, and East Asia. The current study explores values in Nepal (and the USA as a comparison), investigating the structure of values and their association with reported likelihood of engaging in pro-environmental behaviors (L-PEB).

1.1. Personal Value Orientations

Values are deeply held guiding principles that influence and shape attitudes and actions across different contexts [3]. They are often conceptualized as goals representing one's preferred future and can act as frameworks through which one judges their own and others' behavior. For example, having a value of environmental stewardship indicates a desire and goal to protect and take care of the environment. People can also hold different values simultaneously, but prioritize them based on relative importance [3,4]. While values implicate future behavior in pursuit of value-oriented goals, it is important to explore which values are best suited for motivating specific desired behaviors such as pro-environmental behaviors.

Schwartz [3] identified ten distinct types of values (universalism, benevolence, conformity, tradition, security, power, achievement, hedonism, stimulation, and self-direction), which are further categorized into two dimensions: conservation vs. openness and self-transcendence vs. self-enhancement. In the current research, we focus on the second dimension, with self-transcendence values representing the motivation to move beyond self-interest to promote the greater good (i.e., universalism and benevolence) and self-enhancement values representing the motivation of individuals to prioritize self-interest (i.e., power, achievement, and hedonism). Drawing on Schwartz's self-transcendent and self-enhancement value dimensions, Stern [5] and De Groot and Steg [6] identified three "value orientations", which are relevant to pro-environmental behavior: biospheric value orientation, altruistic value orientation, and egoistic value orientation.

Biospheric value orientation corresponds to self-transcendent values and represents prioritizing the welfare of more-than-human species, ecosystems, and the biosphere [5–9]. Biospheric values emphasize the intrinsic value of nature and represent a desire to respect and protect nature and the environment for its own sake, without a clear link to the welfare of the self or other human beings [9]. Individuals who endorse a biospheric value orientation would consider the costs and benefits of pro-environmental behaviors and outcomes for nature when making choices about the environment [9,10].

Altruistic value orientation also corresponds to self-transcendent values and represents prioritizing the welfare of other human beings and the desire for the betterment of other close and/or distant people [5,6,8–10]. Individuals who endorse altruistic values would consider the costs and benefits of pro-environmental behaviors and outcomes for others and humanity when making choices about the environment [6,8].

Egoistic value orientation corresponds to self-enhancement values and represents motivation toward positive personal outcomes [5,6,8,10]. Individuals who endorse an egoistic value orientation prioritize personal gains like power, authority, wealth, and influence [10]. They will consider the costs and benefits of pro-environmental behaviors and outcomes for them personally and make sustainable choices if the perceived personal benefit of the action is higher than the perceived personal cost [9].

1.2. Personal Value Orientations as Distinct Constructs

Empirical studies have consistently shown that biospheric-altruistic values (reflecting self-transcendent values) and egoistic values (reflecting self-enhancement values) are dis-

tinct value clusters across many cultures [3,8,9,11–14]. However, there is mixed evidence as to whether biospheric values are empirically distinct from altruistic values.

Foundational work by De Groot and Steg [6,9] found clear distinctions between the three value orientations in Austria, the Czech Republic, Italy, the Netherlands, and Sweden. Although in a five-country comparison, the items loaded on the biospheric vs. altruistic factor differed slightly by country, suggesting some overlap in how biospheric and altruistic value orientations are conceptualized across cultures [6]. Other studies in Inner Mongolia province of China [13], Lithuania [15], Japan [11], and Hungary [16] also found distinctions among the three value orientations. Across these studies, biospheric and altruistic value orientations were correlated, at times highly, suggesting they are related but distinct constructs. Explaining the relationships among the three value orientations, Bouman et al. [17] confirmed a hierarchical factor structure where biospheric and altruistic values are distinct but load together on a higher-order self-transcendence dimension.

In contrast, other work claims no distinction between biospheric and altruistic values. For example, early studies with US students found no empirical distinction [7,10]. More recent work has also found evidence that the two value orientations are not distinct in Türkiye [14] and Xi'an province of China [12]. Together, the mixed evidence suggests that the empirical distinction between altruistic and biospheric values is unstable and may vary across different regions and cultures.

The empirical distinction between altruistic values and biospheric values is intriguing because it may reflect how individuals conceptualize the relationship between humans and nature. For example, if humans and nature are viewed as distinct, biospheric and altruistic values may also be seen as distinct. This kind of individual may value both working to ensure equality and welfare for humans and preserving nature but classifies these as different values. In contrast, someone who views humans and nature as interconnected, where humans are part of nature, may not distinguish between biospheric and altruistic values. This kind of individual may see preserving nature as ensuring welfare for humans, and thus valuing one is inseparable from valuing the other.

In the current study, we explore the empirical distinction between biospheric and altruistic values, examining this phenomenon in two settings: Nepal and the USA. Prevailing belief systems in each setting may influence how biospheric, altruistic, and egoistic values are perceived. For example, the extension of altruism to non-human natural entities is higher among individuals who affiliate with religions such as Hinduism [18], which is a dominant belief system in Nepal, and lower among individuals who affiliate with Christianity, which is a dominant belief system in the USA [19]. Further, Richardson et al. [20] found that the latent mean of nature connectedness, which is defined as the extent to which individuals perceived oneness with nature, was highest in Nepal among all 61 countries measured, while the USA ranked 47th out of 61. Therefore, it may be the case that individuals who see themselves as part of nature are less likely to draw a distinction between biospheric and altruistic values. If this holds, biospheric and altruistic values may not appear as distinct constructs in the Nepali sample as in the US sample.

1.3. Personal Values Orientation as Predictors of Pro-Environmental Behavior Across Cultures

Pro-environmental behaviors are actions that minimize harm to nature or that prevent additional harm to nature. Pro-environmental behaviors can be generally categorized into two domains: public-sphere behaviors and private-sphere behaviors. Public behaviors are visible to others (e.g., environmental activism and contributing to environmental initiatives), whereas private behaviors are not (e.g., turning off appliances when not in use and reusing a clothing item) [5,21]. Personal value orientations may be linked to public and private pro-environmental behavior in distinct ways because public and private pro-environmental

behavior differ in the effort they demand, the outcomes they produce, the way they need to be performed, and their potential for social approval or disapproval.

Biospheric value orientation has consistently demonstrated a strong positive relationship with pro-environmental behaviors and behavior intentions in European samples [6,22] and in multiple Asian samples, such as Japan [11], Singapore [23], and Türkiye [14]. Furthermore, research finds that biospheric values mediate the relationship between individuals' connection to nature and their pro-environmental behavior in the USA [24], suggesting that biospheric values may serve as a crucial psychological bridge between environmental connection and action. However, there are cultural exceptions to this relationship. For instance, Liu et al. [13] find that in Inner Mongolia province of China, biospheric value orientation is not significantly associated with environmentally sustainable behavior because environmental issues in that area are linked to economic injustices toward local ethnic culture and identity.

Altruistic value orientation appears to have an inconsistent relationship with pro-environmental behaviors across cultural contexts. Some studies report a positive association with intentions to engage in pro-environmental behavior in samples such as China [13] and Türkiye [25]. However, this relationship is weaker and inconsistent in European samples [6] and Singapore samples [23], while in Japan [11] and Australia [26], it was not significant. Notably, this pattern does not cleanly map onto an Eastern/Western cultural divide or a Global South/Global North divide, suggesting that factors other than cultural variability may mediate the relationship between altruistic value and pro-environmental behavior intention.

Egoistic value orientation also appears to have an inconsistent relationship with pro-environmental behavior across cultural contexts, with some studies reporting a negative association and others reporting a positive association. Studies in Europe [6,22] and Japan [11] have found egoistic values negatively related to pro-environmental behavior. However, this relationship has not held up in Asian samples like Singapore [23], Türkiye [14], and Malaysia [27], where no significant association was found. Strikingly, a growing number of recent studies report an opposite pattern where egoistic values are positively linked to pro-environmental behavior intention in India [28], China [12], and Korea [29]. This reversal suggests that egoistic values may not always inhibit pro-environmental behavior.

1.4. Rationale of the Current Study

The variability in value structure and the value–behavior relationship across cultural contexts suggests that these phenomena are not universal across regions and cultural settings. This highlights the importance of examining these constructs beyond the Western context where most measures of values and environmental behavior were originally developed. However, the existing literature on non-Western value structures and value–behavior relationships tends to rely heavily on prominent and economically influential countries like India [28], China [12,13], Japan [11], South Korea [29], and Türkiye [14], leaving smaller, less economically influential nations like Nepal largely underrepresented. This underrepresentation constrains the field's ability to determine the universality of these phenomena. Addressing this gap is necessary to design culturally sensitive psychological interventions, communication strategies, and educational curricula that foster pro-environmental behavior at a global scale. In this study, we explore value structure and the association between values and pro-environmental behavior in samples of undergraduate students in Nepal and the USA.

We chose Nepal as our research context for two reasons. First, as a developing country with complex topography, Nepal is highly vulnerable to climate-change-driven environmental threats [30], making it increasingly important to understand the drivers of

pro-environmental behavior in this setting. However, no research on value orientations in relation to pro-environmental behavior has been conducted in Nepal to date. Second, Nepal's distinctiveness is evident in its quality of governance, which refers to the capacity and effectiveness of public institutions to act in the public interest. According to the World Bank's 2024 Worldwide Governance Indicators (WGI), which measure the quality of governance based on six core dimensions (political stability, government effectiveness, regulatory control, control of corruption, rule of law, accountability). Nepal's governance effectiveness score was 34.14 out of 100 [31]. This is significantly lower than neighboring countries like India (59.21) and China (68.76) [31]. This difference is theoretically important as lower governance quality is associated with weaker relationships between environmental concern and behavior [32], since individuals in such contexts often have less agency, fewer resources, and less institutional protection to act on their principles and beliefs. If this holds, individuals in Nepal may hold strong values of environmental protection but fail to translate them into pro-environmental behavior.

We chose the USA as a comparison because it was readily accessible to us and differs from Nepal along several dimensions relevant to our research question. For example, it has high governance effectiveness (77.78 out of 100) [31], is a more developed economy, and is one of the countries where foundational research on values and pro-environmental behavior was conducted [8].

The current research is guided by the following research questions:

Research Question 1: What is the structure of personal value orientations in undergraduate students in Nepal and the USA?

Research Question 2: How are personal values orientation associated with the reported likelihood of engaging in pro-environmental behavior (L-PEB) in undergraduate students in Nepal and the USA?

2. Methods

2.1. Participants

This study was approved by the Northeastern University Institutional Review Board (IRB; approval no. 25-01-15) and was determined to be exempt from requiring formal consent. Given the exploratory nature of this work, we sampled participants based on access and participant availability and did not conduct a formal a priori power analysis. Additionally, in both studies, participants were excluded based on incomplete and straight-lining responses. We identified straight-lining by excluding participants who provided identical responses to all value orientation items, indicating a lack of meaningful engagement and attention to the study.

2.1.1. Nepali Sample

We recruited 180 undergraduate students from four universities in Kathmandu, Nepal, to complete the study. We recruited participants using a QR code printed on pamphlets distributed around the universities from 27 January 2025 to 7 February 2025. Participants from Nepal were compensated Rs 100 (equivalent to $0.72 as of 3 February 2025) for their participation, aligned with the average compensation in the area [33]. We excluded 25 participants who did not complete the study and 13 participants for straight-lining, resulting in a final sample of N = 142. The mean age of Nepali participants was 22 years, and 86.62% of participants reported following Hinduism, followed by Buddhism (4.23%), Christianity (4.23%), and Islam (1.41%). Additionally, 2.82% reported being non-religious, and less than 1% followed a religion not listed. We did not collect data on participants' gender or race/ethnicity.

2.1.2. US Sample

We recruited 100 undergraduate students from a university in Boston, Massachusetts, through an introductory psychology course. Students received course research credit for completing the survey. We excluded 10 participants who did not complete the survey, resulting in a final sample of $N = 90$. The mean age of US participants was 19 years, and 44.4% reported being non-religious. Of those who reported following a religion, 32.2% followed Christianity, followed by Hinduism (10%), Judaism (4.44%), Islam (3.33%), and Buddhism (2.22%). We did not collect data on participants' gender or race/ethnicity.

2.2. Measures

2.2.1. Personal Value Orientations

A 12-item scale validated by De Groot and Steg [6] was used to measure value orientations. The items represent biospheric value orientation (e.g., How important is it for you to live in harmony with nature around you?), altruistic value orientation (e.g., How important is it for you to ensure everyone has equal opportunities in the world?), and egoistic value orientation (e.g., How important is it for you to have authority over other people?). In line with Schwartz [3], Stern and Dietz [10], and De Groot and Steg [6], participants rated each value on a 9-point rating scale where −1 indicated that the statement was "opposed to my values", 0 indicated that the value was "not important", and 7 indicated that the value was "extremely important". Following Schwartz [3], the participants were urged to vary the scores they assigned to each value as much as possible. The value items were presented in a random order to avoid order bias. Complete items are listed in Appendix B.

2.2.2. Likelihood of Engaging in Pro-Environmental Behavior (L-PEB)

The types of relevant pro-environmental behaviors can vary in different social and cultural contexts. For example, behaviors such as driving one's personal vehicle less may be relevant in North America, where personal car use is prevalent, but not relevant in countries where most people do not own a vehicle. Despite possible differences, most existing pro-environmental behavior measures are developed and tested in Global North samples [34]. Therefore, we developed a novel measure of the likelihood of pro-environmental behavior to capture relevant behaviors in both Nepal and the USA. We use a behavioral expectation measure because it has been found to better predict actual pro-environmental behavior than measures of behavioral intentions, as it accounts for practical constraints that may limit an individual's ability to engage in the behavior [35].

We developed items relevant to Nepali participants through open-ended responses from 20 Nepali Reddit users recruited from the subreddit r/Nepal, an online community for Nepali people with over 152,000 weekly visitors as of September 2026. Respondents answered: "What do you do in your day-to-day life that protects and conserves the environment?" (see Supplemental Materials Section S6.0 for full responses). Responses included behaviors such as reusing food containers and not littering. Behaviors relevant to US participants were based on items from Mateer et al. [36] and included topics such as walking or riding a bike for short distances and talking with others in their community about environmental issues. Altogether, 20 items were created (13 pro-environmental and 7 negative environmental behaviors) across 10 hypothetical scenarios focusing on different public or private behaviors. Participants read each scenario, accompanied by graphics, and reported their likelihood of engaging in the behaviors on a scale from 1 (extremely unlikely) to 7 (extremely likely). The graphics accompanying the scenario were generated using DALL-E3 (OpenAI, 2023), accessed via ChatGPT (v. 4.0, OpenAI, 2024). See Table 1 for examples; complete items are listed in Appendix A.

Table 1. Example of scenario-based approach for measurement of reported likelihood to engage in pro-environmental behavior.

Type of Scenario	Example
Public Pro-Environmental Behavior	"You have {Rs 100/$10}, and you are planning to get a snack with it. People from an environmental conservation organization approach you with a donation request. How likely are you to donate it to the environmental conservation organization?" [rate likelihood] "How likely are you to not donate it and buy the snack?" [rate likelihood]
Private Pro-Environmental Behavior	"You got a rip in your sweater. How likely are you to sew it and use it?" [rate likelihood] "How likely are you to throw it away?" [rate likelihood]

A scenario-based approach was taken to increase ecological validity and thus improve predictive validity. The negative environmental behavior alternatives were included because respondents could falsely rate a higher likelihood of engaging in pro-environmental behavior because of social desirability bias. As such, we wanted to see how they would respond to negative environmental behavior and whether it is related to value orientations. The analysis and results on negative environmental behavior and values associated with the negative environmental behavior are presented in the Supplemental Materials Section S5.0.

2.3. Procedure

All measures were presented online using Qualtrics survey software [37]. The respondents first answered questions about their reported likelihood of engaging in pro-environmental behavior, which included ten scenarios that were presented in a randomized order (see Appendix A). Next, participants responded to questions on their personal value orientation (see Appendix B), environmental cognition (which was collected for another project), and their demographics. The median time to complete the survey was 12.50 min for Nepali participants and 11.52 min for US participants.

Since the Nepali universities where we collected the data conducted all courses in English, the questionnaire was presented to all participants (Nepali and US) in English. However, some phrases were clarified in the Nepali version of the questionnaire. For example: "please rate these as a guiding principle in your life" was changed to "please rate how important you think these principles are in your life."

2.4. Data Analysis

To prepare the value orientation data for analysis, we recoded all "−1" responses to 0 "not important" to maintain the linear interval scale. The original −1 to 7 scale spans two distinct dimensions: −1 indicates whether a value is endorsed at all, and 0–7 indicates value importance. Thus, the gap between "opposed to my values" (−1) and "not important" (0) represents a qualitative difference in kind rather than a difference in degree. Recoding −1 to 0 preserves the participant's response that they do not endorse the value while also maintaining a scale with equal numerical intervals.

In both countries, we conducted exploratory factor analysis (EFA) to explore the factor structure of the value orientations and likelihood of engaging in pro-environmental behavior (L-PEB) measure. Across models, items were retained on a factor if their factor loading was greater than 0.40 and the item did not cross-load on another factor. An item was considered cross-loading if the item had a factor loading greater than 0.32 on more than one factor and the difference between those factor loadings was less than 0.15 [38]. To

explore how value orientations are associated with L-PEB, we conducted path analyses in each sample, with value orientations as predictors and L-PEB as the outcome variable.

Given the differing social, institutional, and economic conditions between Nepal and the USA, we do not assume measurement invariance across the two samples. However, because of the limited sample size (especially in the US sample), a multi-group confirmatory factor analysis was not pursued. Thus, we conducted all analyses independently in each sample and compared the results qualitatively. In all analyses, we handled missing data using pairwise deletion to retain the maximum amount of data. In line with this approach, we report empirical chi-squares based on the harmonic mean of observations.

3. Results

3.1. The Structure of Personal Value Orientation in the Nepali and US Samples

3.1.1. Structure of Personal Value Orientation in the Nepali Sample

An EFA was used to explore the factor structure of the value orientation measure in Nepal. (Exploratory factor analyses) were used instead of confirmatory factor analyses (CFAs) due to the small sample size in the US sample ($N < 100$), which can make the CFA model fit unstable and challenging to compare multiple models. Therefore, we opted for an exploratory approach, while noting that a small sample size is still a limitation for EFAs. Indeed, following a recommended 10 participants per indicator, a sample of 120 is considered sufficient for EFA; given that the US sample is below this ($N = 90$), we interpret findings with caution.) We conducted the EFA on the 12 value orientation items using the maximum likelihood extraction method with Promax rotation. To ensure the data were suitable for EFA, we conducted a Kaiser–Meyer–Olkin (KMO) sampling adequacy test. The overall KMO was 0.81, which is considered acceptable for factor analysis [39].

We retained factors based on a triangulation of eigenvalues greater than one, a parallel analysis, a visual inspection of the scree plot, and theoretical interpretability. The number of eigenvalues >1 and the parallel analysis suggested a three-factor structure, whereas the scree plot suggested a two-factor solution (see Supplemental Materials, Section S1.0); thus, we inspected both models. In the three-factor model, the first factor combined items conceptually associated with both biospheric and altruistic values (equality, helpful, protecting the environment, and preventing pollution). The second factor grouped items conceptually associated with biospheric, altruistic, and egoistic values (helpful, respecting the earth, social justice, wealth), and the third factor consisted of "authority; influence". Two items, "a world at peace; social power", did not load onto any factor, and "helpful" cross-loaded on factors one and two. In the two-factor model, eight items representing biocentric and altruistic values loaded onto a single factor, whereas three items reflecting egoistic values loaded onto the second factor. One item, "wealth", did not load onto any factor, and there were no cross-loading items (see Table 2).

We retained the two-factor model because it had no cross-loading items and was theoretically interpretable. The model showed a modest fit, χ^2 (43) = 88.14, $p < 0.001$, RMSEA = 0.114, 90% CI [0.091, 0.139], RMSR = 0.07, and the mean communality of items was moderate, $h^2 = 0.45$, with a wide range from 0.17 to 0.65, suggesting some instability in the factors [40,41]. In further analyses, each factor is treated as a distinct scale representing biospheric-altruistic values and egoistic values. To measure the internal consistency, we calculated Cronbach's alpha for each scale. Biospheric-altruistic values included eight items and demonstrated good reliability ($\alpha = 0.86$), and egoistic values included three items and demonstrated modestly acceptable reliability ($\alpha = 0.65$) (Cronbach's alpha is highly sensitive to the number of items included in a measure. Only three items contributing to the overall consistency of the measure could be contributing to the alpha value below the usual 0.70 cutoff.).

Table 2. Factor loadings for personal value orientations in Nepali and US samples.

	Nepal		USA		
Value Orientation Items	**Biospheric-Altruistic Values**	**Egoistic Values**	**Biospheric Values**	**Altruistic Values**	**Egoistic Values**
A world at peace: free of war and conflict	**0.591**	−0.161	0.274	**0.583**	−0.046
Equality: Equal opportunities for all	**0.792**	−0.087	−0.109	**0.815**	−0.244
Helpful: working for the welfare of others	**0.728**	0.052	0.094	**0.505**	0.216
Social justice: correcting injustice, care for the weak	**0.741**	0.057	−0.097	**0.844**	0.055
Respecting the earth: harmony with other species	**0.508**	0.060	**0.502**	0.161	0.101
Protecting the environment: preserving nature	**0.732**	−0.108	**0.858**	0.074	−0.281
Preventing pollution: protecting natural resources	**0.636**	−0.024	**0.928**	−0.071	−0.040
Unity with nature: fitting into nature	**0.706**	0.008	**0.838**	−0.142	0.133
Authority: the right to lead or command	0.010	**0.769**	−0.049	−0.056	**0.821**
Influential: having an impact on people and events	0.184	**0.768**	−0.100	0.212	**0.564**
Social power: control over others, dominance	−0.160	**0.401**	0.001	−0.165	**0.841**
Wealth: material possessions, money	0.391	0.237	0.047	−0.027	0.302

Note: The bolded numbers represent items retained on a factor.

To assess differences in endorsement of each value orientation, we used a linear mixed model predicting composite score from value type with a random intercept for participant to account for the nested data structure. This model revealed a significant main effect of value type, χ^2 (1) = 450.73, $p < 0.001$, η^2_p = 0.76, 95% CI [0.70, 0.81], showing that biospheric-altruistic values (M = 6.30, SE = 0.11) are more highly endorsed than egoistic values (M = 3.15, SE = 0.11).

3.1.2. Structure of Personal Value Orientation in the USA

To explore the structure of personal values in the USA, we replicated the EFA process in the US sample using maximum likelihood extraction with Promax rotation. We conducted a Kaiser–Meyer–Olkin (KMO) sampling adequacy test to ensure the data were suitable for EFA. The overall KMO was 0.75, which is considered acceptable for factor analysis [39].

The number of eigenvalues > 1, parallel analysis, and a visual inspection of the scree plot all suggested a three-factor structure (see Supplemental Materials Figure S2). Inspecting the three-factor structure, items loaded, without cross-loading, on their expected factor, aligning theoretically with the three value orientations [6]. As in the Nepali sample, the "wealth" item did not load onto any factor and was dropped from further analysis (see Table 2 for all factor loadings).

We accepted the three-factor solution, which showed acceptable fit, χ^2 (33) = 30.02, p = 0.616, RMSEA = 0.081 [90% CI: 0.036, 0.122], RMSR = 0.051, TLI = 0.899. The mean communality of items was moderate (h^2 = 0.55), with a wide range from 0.10 to 0.80, suggesting some instability in the factors [40,41]. In further analyses, each factor is treated as a distinct scale representing biospheric values, altruistic values, and egoistic values. To measure internal consistency, we calculated Cronbach's alpha for each scale. Biospheric value, with four items, demonstrated good reliability (α = 0.86); altruistic value, with four

items, demonstrated acceptable reliability ($\alpha = 0.79$); and egoistic value, with three items, demonstrated acceptable reliability ($\alpha = 0.77$).

To assess differences in endorsement of each value orientation, we used a linear mixed model predicting composite score from value type with a random intercept for participant. This model revealed a significant main effect of value type, χ^2 (2) = 197.53, $p < 0.001$, $\eta^2_p = 0.53$, 95% CI [0.43, 0.60]. Pairwise comparisons of estimated marginal means with a Tukey correction show that endorsement of biospheric ($M = 4.77$, $SE = 0.15$) and altruistic values ($M = 5.07$, $SE = 0.15$) did not differ, $p = 0.26$, and both were endorsed more than egoistic values ($M = 2.58$, $SE = 0.15$), $p < 0.001$.

3.2. Personal Value Orientations and L-PEB in the Nepali and US Samples

Given our use of a novel measure of behavior intentions, we first explore the factor structure of our measure in each sample and then examine the association between value orientations and behavior intentions. We present these analyses separately for Nepal and the USA.

3.2.1. Structure of Pro-Environmental Behavior in the Nepali Sample

To explore the factor structure of the behavior measure, we used an EFA. We conducted a Kaiser–Meyer–Olkin (KMO) sampling adequacy test to ensure the data were suitable for EFA. The overall KMO was 0.56, which is just below the acceptable cutoff of 0.60 to be considered acceptable for factor analysis [39]; therefore, findings should be interpreted with caution. Based on the number of eigenvalues > 1 and parallel analysis, we suggested a six-factor structure (see Supplemental Materials Figure S3). However, based on a visual inspection of the scree plot and the acceleration factor, a two-factor solution could also be a good fit. Thus, we fit both a six- and two-factor model using maximum likelihood extraction and a Promax rotation.

The six-factor model showed acceptable fit, χ^2 (15) = 11.79, $p = 0.122$, RMSEA = 0.054 [90% CI: 0.000, 0.104], RMSR = 0.026; however, the factors were not readily interpretable, and the good fit is consistent with overfitting given the item-to-factor ratio and modest sample size, rather than evidence of a meaningful or replicable factor structure. One factor appeared to represent private pro-environmental behavior (reusing plastic, recycling plastic, and biking short distances) and a second factor represented public behaviors (donating to environmental causes and discussing environmental issues); however, across the other four factors there were only one or two items that loaded above the >0.40 cutoff on each factor, including "biking short distances", which cross-loaded on Factors 1 and 3 (see Supplemental Materials Table S2 for factor loadings).

The two-factor model showed worse fit than the six-factor model, though the fit was still moderately acceptable, χ^2 (53) = 167.04, $p < 0.001$, RMSEA = 0.118, 90% CI [0.097, 0.140], RMSR = 0.100; the factor loadings were more theoretically interpretable, and there were no cross-loadings (see Table 3). The relatively poor fit may be due to the large number of items (six items) that did not load onto any factor. Among the remaining seven items, a factor representing public pro-environmental behavior emerged (donating to environmental causes and discussing environmental issues), as did a second factor representing private pro-environmental behaviors (reusing plastic, recycling plastic, reducing energy consumption, walking short distances, and biking short distances). Given the theoretical interpretability and strong factor loadings of the two-factor model, we retained this model over the six-factor model. Items from each factor were averaged together, yielding composite scores for reported likelihood of engaging in public pro-environmental behavior in the Nepali sample (Nepali Public L-PEB) with two items (Cronbach's $\alpha = 0.73$) and reported likelihood

of engaging in private pro-environmental behavior in the Nepali sample (Nepali Private L-PEB) with five items (Cronbach's $\alpha = 0.73$).

Table 3. Factor loadings for pro-environmental behavior in Nepali and US samples.

	Nepal		USA	
Pro-Environmental Behavior Items	Private	Public	Private	Public
Reusing plastic: Reusing an empty yogurt tub	**0.705**	−0.235	**0.415**	0.125
Recycling plastic: Recycling an empty yogurt tub	**0.632**	−0.007	0.245	0.049
Reducing energy consumption: Turning off electrical appliances while not in use	**0.437**	0.111	0.021	0.203
Walking: Walking short distances	**0.433**	−0.157	0.158	0.197
Biking: Biking short distances	**0.674**	−0.031	−0.011	0.040
Donating: Donating $10/Rs 100 to an environmental cause	0.143	**0.522**	0.102	**0.495**
Discussing: Discussing environmental issues	0.051	**0.977**	0.431	0.374
Composting: Composting food waste	0.259	0.089	**1.068**	−0.447
Reusing clothing: Sewing and reusing a slightly torn sweater	0.005	0.003	**0.452**	0.082
Volunteering: Spending days off volunteering for environmental causes	0.032	0.201	0.098	**0.689**
Sustainable purchase: Purchasing a higher-priced sustainably produced product	−0.095	0.297	0.176	**0.407**
Reducing food waste: Saving leftover food	−0.041	0.153	−0.350	0.460
Using public transit: Using public transit for short distances	0.261	0.216	0.222	−0.017

Note: The bolded numbers represent items retained on a factor.

To assess differences in type of behavior intention, we used a linear mixed model predicting the composite score from behavior type with a random intercept for participant to account for the nested data. This model revealed a significant main effect of value type, χ^2 (1) = 60.35, $p < 0.001$, $\eta^2_p = 0.30$, 95% CI [0.18, 0.42], showing Nepali participants reported being less likely to engage in public behaviors ($M = 4.05$, $SE = 0.12$) than private behaviors ($M = 5.18$, $SE = 0.12$).

3.2.2. Personal Value Orientation and Pro-Environmental Behavior in the Nepali Sample

To test the association between personal value orientation and Pro-Environmental Behavior, we conducted a path analysis with biospheric-altruistic and egoistic value orientation scores as independent variables and public and private pro-environmental behavior scores as the dependent variables. The two value composites and two behavior composites were allowed to covary in the model to account for shared variance (see Figure 1).

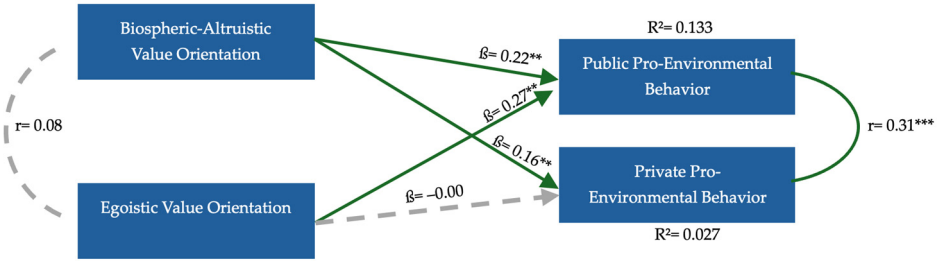


Figure 1. Path analysis of public L-PEB and private L-PEB in the Nepali sample. Note: ** $p < 0.01$/*** $p < 0.001$. Lines denote correlations; arrows denote paths. Dashed gray lines/arrows indicate a non-significant relation at $p > 0.05$; solid green lines/arrows indicate significant relations.

Value orientation explained 13.3% of the variance in Nepali public L-PEB. Endorsement of biospheric–altruistic value orientation was significantly associated with Nepali public L-PEB (β = 0.22, *SE* = 0.13, *p* = 0.003). Likewise, endorsement of an egoistic value orientation was associated with greater engagement in Nepali public L-PEB (β = 0.27, *SE* = 0.07, *p* = 0.001).

Value orientations explained 2.7% of the variance in the reported likelihood of engaging in Nepali private L-PEB. Biospheric-altruistic value orientation (β = 0.16, *SE* = 0.11, *p* = 0.005) was associated with Nepali private L-PEB. However, egoistic value orientation (β = −0.01, *SE* = 0.07, *p* = 0.947) was not significantly associated with Nepali private L-PEB. Nepali public and private L-PEB were positively correlated (r = 0.31, *SE* = 0.15, $p < 0.001$). The biospheric-altruistic and egoistic value orientations were not significantly correlated (r = 0.08, *SE* = 0.10, *p* = 0.324).

3.2.3. Structure of Pro-Environmental Behavior in the US Sample

To determine the factor structure of pro-environmental behavior in the US sample, we repeated the process used for the Nepali sample using EFA. We conducted a Kaiser–Meyer–Olkin (KMO) sampling adequacy test to ensure the data were suitable for EFA. The overall KMO was 0.58, which is just below the acceptable cutoff of 0.60 to be considered acceptable for factor analysis [39]; therefore, findings should be interpreted with caution. Based on the number of eigenvalues >1, a five-factor structure was suggested (see Supplemental Materials Figure S4). However, based on the parallel analysis and a visual inspection of the scree plot, a two-factor solution could also be a good fit. Thus, we fit both a five- and two-factor model using maximum likelihood extraction with a Promax rotation.

The five-factor model showed a good fit χ^2 (23) = 18.63, *p* = 0.723, RMSEA = 0.000 [90% CI: 0.000, 0.062], RMSR = 0.040. However, the five factors were not theoretically interpretable. For example, one factor appeared to represent both public and private behaviors (sustainable purchase, reusing plastic, reusing clothing, donating to environmental causes, and volunteering for environmental causes). A second factor included the two items involving food waste: "composting" and "reducing food waste (negative loading)". The other three factors were less clear, with one factor having two items and the other two having one item each that loaded above the >0.40 cutoff (see Supplemental Materials Table S3 for factor loadings).

The two-factor model showed acceptable fit χ^2 (53) = 78.19, *p* = 0.014, RMSEA = 0.044 [90% CI: 0.000, 0.084], RMSR = 0.083. Two items (reducing food waste and discussing environmental issues) cross-loaded and were thus dropped. The final two factors represented public (sustainable purchase, donating to environmental causes, and volunteering for environmental causes) and private (reusing plastic, composting, and reusing clothing) pro-environmental behaviors. The five remaining items did not load onto either factor and were removed from further analyses (see Table 3). Given the theoretical interpretability and to maintain consistency with the Nepali sample, we retained this model over the six-factor model. Items from each factor were averaged together to yield composite scores for US public L-PEB with three items (Cronbach's α = 0.66) and US private L-PEB with three items (Cronbach's α = 0.60).

To assess differences in type of behavior intention, we used a linear mixed model predicting the composite score from behavior type with a random intercept for participant to account for the nested data structure. This model revealed a significant main effect of value type, χ^2 (1) = 40.73, $p < 0.001$, $\eta^2_p = 0.32$, 95% CI [0.17, 0.46], showing US participants reported being less likely to engage in public behaviors (*M* = 2.95, *SE* = 0.11) than private behaviors (*M* = 3.88, *SE* = 0.14).

3.2.4. Personal Value Orientation and Pro-Environmental Behavior in the US Sample

To examine the degree to which value orientation was associated with pro-environmental behavior, we conducted a path analysis using biospheric, altruistic, and egoistic value orientation scores as predictors and US public and private L-PEB scores as outcomes. The two value composites and two behavior composites were allowed to covary in the model to account for shared variance (see Figure 2).

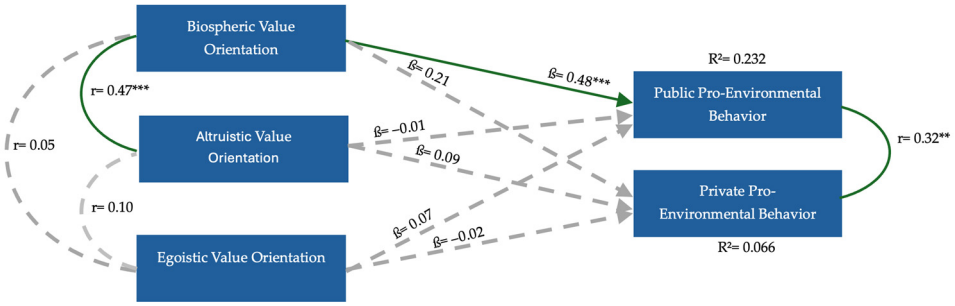


Figure 2. Path analysis of public L-PEB and private L-PEB in the US sample. Note: ** $p < 0.01$/*** $p < 0.001$. Lines denote correlations; arrows denote paths. Dashed gray lines/arrows indicate a non-significant relation at $p > 0.05$; solid green lines/arrows indicate significant relations.

The model showed that value orientation explains 23.2% of the variance in US public L-PEB. Higher endorsement of biospheric values was significantly and positively associated with US public L-PEB (β = 0.48, *SE* = 0.06, $p < 0.001$). In contrast, neither altruistic (β = −0.01, *SE* = 0.08, $p = 0.930$) nor egoistic (β = 0.07, *SE* = 0.06, $p = 0.461$) value orientations were significantly associated with US public L-PEB.

The path model also revealed that the three value orientations explain 6.6% of the variance in US private L-PEB. Biospheric value orientation approached but did not reach conventional levels of statistical significance as a positive predictor of US private L-PEB (β = 0.21, *SE* = 0.11, $p = 0.098$), whereas neither egoistic (β = −0.02, *SE* = 0.073, $p = 0.860$) nor altruistic (β = 0.09, *SE* = 0.12, $p = 0.489$) value orientations were associated with US private L-PEB. US public and private L-PEB were found to be positively correlated (r = 0.32, *SE* = 0.12, $p = 0.003$). Likewise, biospheric and altruistic value orientations were positively correlated (r = 0.47, *SE* = 0.22, $p < 0.001$). However, egoistic value orientation was not significantly correlated with biospheric (r = 0.05, *SE* = 0.22, $p = 0.583$) nor altruistic value orientation (r = 0.10, *SE* = 0.19, $p = 0.299$).

4. Discussion

4.1. Biospheric and Altruistic Value Orientations Pattern Differently in Undergraduate Students in Nepal and the USA

One goal of this study was to explore the structure of biospheric, altruistic, and egoistic value orientations in two settings: Nepal and the USA. We found that in the Nepali sample, biospheric and altruistic items loaded onto a single factor, whereas in the US sample, they loaded onto two distinct (albeit correlated) factors. This indicates that among Nepali participants, valuing the welfare of humans and nature was viewed as a single construct. This may indicate a perception of humans and nature as existing in a single intertwined system. Among US participants, valuing the welfare of humans and nature represented distinct underlying psychological constructs, suggesting greater perceived separation between humans and nature.

In both samples, egoistic values factored onto a unique dimension, suggesting a fundamental difference in valuing things that benefit oneself and valuing things that benefit others, including humans and nature. This distinction is theoretically aligned

with the dimension underpinning the three value types: self-transcendence and self-enhancement [3], where biospheric and altruistic values extend beyond the self while egoistic values are self-focused.

These patterns may reflect how the self is perceived in relation to nature (i.e., self-construal). Specifically, research on including nature in one's sense of self (e.g., nature connectedness, see Schultz [42], or meta-personal self-construal, see Arnocky et al. [43]) examines the tendency to consider all natural beings, not just other human beings, as part of the "self". This self-construal may involve viewing the wellbeing of the non-human natural world as not fundamentally different from the wellbeing of other human beings. As noted above, in a recent study of 61 nations, Nepal ranked first in nature connectedness [20], which could explain the non- distinction in valuing the welfare of non-human natural entities and humans in our Nepali sample.

Moreover, prior studies have found meta-personal self-construal to be high in Hindu populations [18]. Nepal has a majority Hindu population, and despite being constitutionally secular, many aspects of daily life, social norms, and public institutions have historically been shaped by Hindu values and traditions [44]. Within Hindu philosophical traditions, self-realization is described as recognizing one's unity with all existence, "Aham Brahmasmi" [45], which aligns with theories of meta-personal construal. Further, perceiving the individual self "Atman" as distinct from the rest of the biosphere, "Brahman" is considered ignorance caused by the illusion of the material world, "Maya."

Likewise, meta-personal self-construal is low in the Christian population [19]. The USA has a majority Christian population, and some scholars argue that Christian ideals and tradition continue to shape daily life and norms in the US context, influencing the worldview of individuals who do not follow Christianity [46]. Moreover, in a recent study, the USA ranked 47th out of 61 countries in nature connectedness [20], which could explain the distinction in valuing the welfare of non-human natural entities and humans in our US sample.

Given this, we tentatively propose that this religiously shaped worldview and way of life may contribute to strong nature connectedness and meta-personal self-construal. This could partially explain why valuing the welfare of humans and nature does not form distinct constructs in our Nepali sample and they form distinct constructs in our US sample. Nepal and the USA are both religiously and culturally diverse countries, and this pattern in our relatively small undergraduate student sample provides a valuable foundation for future work. We encourage future studies to build on these initial findings with larger, more diverse samples to empirically test whether meta-personal self-construal accounts for the lack of distinction between biospheric and altruistic value orientations.

4.2. Pro-Environmental Behaviors Pattern Differently in Undergraduate Students in Nepal and the USA

Exploratory factor analysis revealed that pro-environmental behaviors fell into two categories, which we labeled "public" and "private". However, the behavioral items capturing public and private pro-environmental behavior differed in the two samples. Only one item, "reusing plastic," was seen as private behavior in both contexts, and only one item, "donating money to environmental causes," was seen as public behavior in both contexts. Several individual behavior items loaded onto a distinct factor in one sample but not onto any factor in the other (e.g., the behaviors that loaded onto the private factor in the Nepali sample did not load onto any factor in the US sample, and vice versa). Because the factors represent distinct constructs in each sample, we analyze them separately within each country rather than comparing them directly. We also label them Nepali private L-PEB, Nepali public L-PEB, US private L-PEB, and US public L-PEB. This result nonetheless suggests that while each sample shows a general distinction between public and private

behaviors, the specific content of those groupings may differ by cultural context [47]. This further supports the view that social practices, available infrastructure, economic constraints, and prevailing conventions shape pro-environmental behaviors [48].

In addition, within each sample separately, this study found that in both the Nepali and US samples, individuals report a higher likelihood of engaging in private pro-environmental behavior than public pro-environmental behavior. We believe this is because private pro-environmental behavior is enacted as part of day-to-day habits or routines, whereas people must go out of their way to engage in public-sphere pro-environmental behaviors, which may require more effort and resources [49].

4.3. Values Differentially Predict Likelihood of Engaging in Pro-Environmental Behavior in Undergraduate Students in Nepal and the USA

One goal of the study was to assess the relationship between values and pro-environmental behavior in undergraduate students in Nepal and the USA. In each sample, values were associated more often with public than with private pro-environmental behaviors in both Nepali and US samples. Notably, the content of those types of behaviors differed (i.e., what a Nepali participant thought was a public behavior may not have been what a US participant thought was a public behavior), meaning we cannot directly compare behavior across samples and instead interpret this as a parallel pattern that emerged independently within each context. This result is also consistent with past research, which found that values and norms explain more public pro-environmental behaviors than private pro-environmental behaviors (e.g., Huang et al. [50]; Hansmann and Binder [21]). Personal values may be more strongly associated with public behaviors because public pro-environmental behavior, such as donating to environmental causes, is undertaken with a clear, explicit intention of achieving environmental sustainability [21]. In contrast, private pro-environmental behavior can be motivated by a range of non-environmental motivators, such as financial incentives (reusing clothing and plastic) or health goals (opting for organic produce or walking/biking short distances), which are not necessarily tied to environmental values despite having environmental repercussions. One implication of this finding is that value-based interventions that aim to encourage pro-environmental behaviors might be more effective at motivating public-sphere pro-environmental behavior than private-sphere behavior.

4.3.1. Personal Value Orientations and Pro-Environmental Behavior in Undergraduate Students in Nepal

For Nepali students, biospheric and altruistic values comprised a single factor, which was positively associated with both Nepali public L-PEB and Nepali private L-PEB. This indicates that individuals who valued prioritizing the welfare of both human beings and the non-human natural world were also likely to engage in pro-environmental behaviors that are both private and visible to others. This shows that, consistent with studies in European samples [6,22] and multiple Asian samples such as Singapore [23], Japan [11] and Türkiye [14], biospheric-altruistic values in Nepal also show a positive relationship with environmentally sustainable behavior.

Egoistic value orientation in Nepal was positively associated with Nepali public L-PEB, but unrelated to Nepali private L-PEB. This suggests that individuals who value power, authority, and influence may be more likely to engage in pro-environmental actions visible to others. This finding differs from the pattern we found in the US sample in the current study. Because pro-environmental behaviors rooted in egoistic value orientation are driven by the pursuit of personal gains [8], we attribute this relationship to a few factors in Nepal's cultural context.

First, Nepal is characterized as a collectivist culture [51,52], in which individuals often feel a sense of duty towards collective efforts [29]. This finding, along with comparable results from other collectivist contexts like China [12], India [28], and South Korea [29], suggests that egoistic values may operate differently in collectivist contexts, potentially aligning with collective goals like environmental protection.

Second, public pro-environmental behavior, along with being visible to other people, also communicates social identity/self-representation [21]. Thus, engaging in public pro-environmental behavior may have private benefits such as increasing social recognition or enhancing self-image [50], especially in Nepal, where actions like organizing social gatherings and events are motivated to signal one's status and gain socio-economic recognition [53].

Finally, a meta-analysis on egoistic values by Lou et al. [54] showed that egoistic values correlate with stronger intentions to engage in pro-environmental behaviors in countries with low psychological distance from environmental degradation. In Nepal, environmental degradation is immediately visible and tangible, where people, especially in Kathmandu, are exposed to and affected by air pollution, water pollution [55], erratic rainfall patterns, and many other environmental challenges. Furthermore, there is limited infrastructure and a lack of institutional protection, causing individuals to experience the consequences of environmental degradation more directly and severely [56]. Since the threat of environmental challenges poses a personal threat to individuals in this geographic context, we believe this might be one of the reasons egoistic values are linked to the reported likelihood of engaging in public pro-environmental behavior. This interpretation is supported by De Dominicis et al. [57], who found that those who endorse high egoistic values were more likely to engage in pro-environmental behavior when it was framed emphasizing personal benefit.

4.3.2. Personal Value Orientations and Pro-Environmental Behavior in Undergraduate Students in the USA

Endorsing biospheric values in the USA significantly predicted US public L-PEB but showed no significant association with US private L-PEB. In other words, individuals who valued prioritizing the welfare of the non-human natural world reported themselves to be likely to engage in environmental action visible to others, but not environmental actions performed privately. This result is also consistent with past research, which shows that values explain more public pro-environmental behaviors than private pro-environmental behaviors (e.g., Huang et al. [50]; Hansmann and Binder [21]).

In the USA, altruistic value orientation did not predict either public or private pro-environmental behavior. These results are consistent with studies like Hiratsuka et al. [11] and Matzek and Wilson [26] and suggest that endorsing altruism towards other people plays little role in shaping environmental action. This null finding could support the explanation that those who perceive biospheric and altruistic values as distinct also perceive humans and nature as separate. If so, it makes sense that in our sample, we found no link between valuing human wellbeing and pro-environmental behavior because the value is not perceived as relevant to the behavior.

In the USA, the results showed that egoistic value orientation was not significantly associated with either public or private pro-environmental behavior. Although this result is consistent with some recent studies [14,23,27], it contrasts with earlier, even foundational, value–belief–norm studies showing a negative association between egoistic values and pro-environmental behavior [6,10,11,22].

We postulate that this growing number of studies, including the present one, that fail to find a negative relationship between egoistic values and pro-environmental behavior may reflect a broader shift. For example, Lou et al. [54] found that, even in Western contexts,

the correlation between egoistic values and environmental action appears to be growing less negative as psychological distance from climate change and global warming decreases. Specifically, as people worldwide are forced to reckon with the fact that they impact and are impacted by the natural environment, environmental protection and wellbeing may increasingly be seen as aligned with self-preservation and wellbeing.

4.4. Limitations and Future Directions

One limitation of this study is that we relied on undergraduate student samples in both settings. As a result, the findings capture the perspectives of a specific age group and a socioeconomic class with access to university education, which limits the generalizability of the results to the broader public in Nepal and the USA. The two samples also differed in age and religious composition, and we did not collect data on gender or ethnicity. These demographic factors may have contributed to differing patterns across the samples, alongside the interpretations we offer. Future studies can address this by recruiting more representative samples with a wider range of ages and socioeconomic classes and collecting data on gender, race, and ethnicity.

Additionally, our relatively small sample size likely affected model fit for the EFAs. Because this method is exploratory, the factor structures we found should be seen as tentative and as a starting point. These findings should be replicated using confirmatory factor analysis (CFA) on a larger sample to confirm the final answer.

Relatedly, because our sample size was insufficient for a multi-group CFA, we did not test measurement invariance between our Nepali and US samples. As a result, we could not statistically confirm whether the value and behavior constructs were measured equivalently across the two settings. This limitation was compounded by the fact that the items loading onto public and private environmental behavior were not consistent between the two samples, limiting cross-cultural comparison of these constructs. Thus, we analyzed the two samples independently rather than comparing them. While these issues constrain our ability to draw cross-cultural conclusions, the differing pattern we observed across the two contexts suggests a meaningful area for future exploration. Future studies with larger samples could formally test measurement invariance, allowing for more rigorous comparison of these constructs across contexts.

Lastly, the paper measures self-rated likelihood to perform pro-environmental behaviors in hypothetical scenarios, which does not always map onto actual behavior [35]. We also created this measure of pro-environmental behavior for this study; thus, it has not been subjected to thorough testing, including confirming structural, content, and construct validity. This common limitation for newly developed measures can be addressed by conducting a dedicated validation study in the future.

Beyond addressing the methodological constraints of this study, one future direction is to pinpoint why we found what we found. Future studies should empirically test the presence of meta-personal self-construal in the Nepali population and examine whether it accounts for the lack of distinction between biospheric and altruistic value orientation. Future studies should also test whether factors such as psychological distance to environmental degradation and cultural indicators like self-construal and individualism-collectivism mediate the value–behavior relationship.

Another future direction is to examine if these findings can inform communication strategies for encouraging pro-environmental behavior. For instance, future studies could test whether messages employing biospheric framing that highlight the consequences of environmental degradation on the ecosystem and the biosphere [22] effectively motivate public pro-environmental behavior in the USA. Likewise, in Nepal, where our findings suggest egoistic values to be a stronger predictor of environmental action, future studies

could test whether messages employing egoistic framing [58] are an effective way to motivate pro-environmental behavior in Nepal.

5. Conclusions

In this study, we examined the structure of personal values and reported likelihood of engaging in pro-environmental behaviors, and the relations between them, among university students in Nepal and the USA. We examined each sample independently rather than conducting a direct cross-cultural comparison and found evidence to suggest that biospheric and altruistic values do not differ empirically in the Nepali sample, whereas they are distinct constructs in the US sample. We also found that egoistic values are positively linked to the likelihood of engaging in public pro-environmental behavior in Nepal but not in the USA.

Because we did not conduct invariance testing, this study cannot formally test for cross-cultural differences between the two samples. However, based on the distinct patterns observed within each sample, we believe the findings offer modest evidence that values may differ structurally and that value–behavior relationships may differ across cultural contexts. The findings also have practical implications for how research should be designed to account for cultural contexts. Namely, fostering pro-environmental behavior requires research across diverse global samples and contexts; measurement tools and prior research findings should not be blindly applied across contexts but rather cross-culturally validated and tested to ensure methodological rigor and cultural responsiveness.

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/su182110756/s1, Figure S1: Scree plot of value orientation items in Nepal; Table S1: Factor loading of three-factor solution of personal values in Nepal; Figure S2: Scree plot of value orientation items in the US; Figure S3: Scree plot of pro-environmental behavior in Nepal; Table S2: Factor loadings of six-factor solution of pro-environmental behavior in Nepal; Figure S4: Scree-plot of pro-environmental behavior in the US; Table S3: Factor loadings of five-factor solution of pro-environmental behavior in the US; Table S4: Relationship between values and reported likelihood of engaging in negative environmental behavior in Nepal; Table S5: Relationship between values and reported likelihood of engaging in negative environmental behavior in the USA.

Author Contributions: Conceptualization, S.S. and J.D.C.; methodology, S.S. and J.D.C.; formal analysis, S.S. and R.A.; investigation, S.S.; resources, J.D.C.; data curation, S.S. and R.A.; writing—original draft preparation, S.S.; writing—review and editing, R.A. and J.D.C.; visualization, S.S.; supervision, J.D.C. and R.A.; project administration, S.S.; funding acquisition, J.D.C. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data supporting results may be obtained by reaching out to the corresponding author.

Acknowledgments: During data collection, the author used DALL-E3 (OpenAI, 2023), accessed via ChatGPT (v. 4.0, OpenAI, 2024), for the purposes of generating images based on text descriptions to accompany survey questions presented to respondents. The authors have reviewed the output and take full responsibility for the content of this publication.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

EFA	Exploratory Factor Analysis
L-PEB	Likelihood of Engaging in Pro-Environmental Behavior
US/USA	United States of America

Appendix A

Reported likelihood of engaging in pro-environmental behavior was measured using the following novel measurement scale (Table A1). The instructions received by the participants were "Please rate how likely you are to do the following things on a seven-point scale: 1 = Extremely Unlikely to 7 = Extremely Likely".

Table A1. Environmentally significant behavior measurement scale.

Hypothetical Scenario	Image	Question
You go to a store and have an option to choose between these two products. Product A (sustainably produced, costs Rs 150/$12), Product B (not sustainably produced, costs Rs 100/$8).		1. How likely are you to purchase product A (Sustainably produced) 2. How likely are you to purchase product B (Not sustainably produced)
You just finished a tub of yogurt		1. How likely are you to throw the yogurt tub in the trash? 2. How likely are you to reuse it for something? 3. How likely are you to recycle it?
You cooked/ordered too much food and cannot finish it.		1. How likely are you to throw it away? 2. How likely are you to compost it? 3. How likely are you to store it for the next day?
You got a rip in your sweater		1. How likely are you to throw it away? 2. How likely are you to sew it and use it?
You ate a snack but cannot find a trash can nearby		1. How likely are you to throw it wherever?

Table A1. *Cont.*

Hypothetical Scenario	Image	Question
You have Rs 100/$10, and you are planning to get a snack with it. People from an environmental conservation organization approach you with a donation request.		1. How likely are you to donate it to an environmental conservation agency 2. How likely are you to not donate it and eat the snack
You are going out for a few hours and have the air conditioning and lights on.		1. How likely are you to turn off the lights and air conditioning before you leave
You are going to meet a friend who lives 1 mile away.	No image used.	1. Use public transport, e.g., bus, train 2. Use your private vehicle 3. Walk 4. Use a bicycle
You are meeting up with a group of friends/co-workers.	No image used.	1. How likely are you to be talking with them about environmental issues
You have a couple of days off from school.	No image used.	1. How likely are you to spend that time participating as an active member in a local environmental group?

Appendix B

Value orientation was measured using a 12-item validated scale [6]. The instruction received by the participants was "Please indicate how important you think the value is as a guiding principle in your life. Please drag the sliding scale from −1 = Opposed to My Values (later recoded as 0), 0 = Not Important, 7 = Extremely Important".

Table A2. Value orientation measurement scale.

Value Orientation	Descriptor	Item
BIO 1	Respecting the earth	How important is it for you to live in harmony with species other than Homo Sapiens?
BIO 2	Protecting the environment	How important is it for you to preserve nature and protect the environment?
BIO 3	Preventing pollution	How important is it for you to protect natural resources and prevent pollution?
BIO 4	Unity with nature	How important is it for you to live in harmony with nature around you?
ALT 1	A world at peace	How important is it for you to ensure we have a world free of war and conflict?
ALT 2	Equality	How important is it for you to ensure everyone has equal opportunities in the world?
ALT 3	Helpful	How important is it for you to be helpful and work for the welfare of other people?
ALT 4	Social Justice	How important is it for you to correct injustice in society and care for the weak?

Table A2. *Cont.*

Value Orientation	Descriptor	Item
EGO 1	Authority	How important is it for you to have authority over other people?
EGO 2	Influential	How important is it for you to be influential and have an impact on other people and events in the world?
EGO 3	Social power	How important is it for you to have social power to control other people?
EGO 4	Wealth	How important is it for you to have money, material possessions and wealth?

Note: BIO—Biospheric; ALT—Altruistic; EGO—Egoistic.

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