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Spiritual Intelligence Fosters Green Actions: The Role of Nature Connectedness in Shaping Pro-Environmental Behavior

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Abstract

This study examines the relations among spiritual intelligence (SI), connectedness to nature (CN), and pro-environmental behavior (PEB) in a sample of 251 Indonesian university students. Employing a cross-sectional design, the study utilized a two-step analytical approach involving Rasch analysis to validate scale reliability and Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the structural model. Rasch analysis confirmed the robustness of the SI, CN, and PEB instruments, continuing the transformation of raw data into logit scores. Descriptive and correlational results indicated moderate positive associations among the three constructs. PLS-SEM analysis revealed a positive relation between SI and PEB ($\beta = .251, p < .001$) and a strong relation between SI and CN ($\beta = .576, p < .001$). Additionally, CN was positively related to PEB ($\beta = .280, p < .001$). The mediation analysis also indicated that CN partially mediates the relation between SI and PEB, suggesting that SI relates to green action through heightened ecological connectedness. The model explained a moderate level of variance ($R^2 = .332$ for CN; $R^2 = .222$ for PEB) with adequate predictive relevance. Theoretically, this study integrates SI into environmental psychology literature. Practically, the findings emphasize the role of spiritual reflection and nature connectedness in fostering sustainable behaviors among Indonesian youth.

Keywords: spiritual intelligence, nature connectedness, pro-environmental behavior, sustainability, Rasch analysis, PLS-SEM.

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In recent decades, environmental sustainability has become an important global concern, especially with the rise of environmental issues such as increased climate change, biodiversity loss, and environmental degradation (Ibáñez-Rueda et al., 2020; Wynes & Nicholas, 2017). Although the environmental problem has been addressed from different perspectives, such as the scientific and policy perspectives, there is also an ethical and spiritual side to the problem, as it is also an environmental sustainability problem that is closely associated with religious virtues and ethical principles (Abumoghli, 2023). In this regard, environmental sustainability requires not only technical solutions and policies, but also an understanding of moral and spiritual values that foster a sense of human responsibility toward nature as a trust that must be safeguarded.

Spiritual intelligence (SI) is the mental capacity that makes it possible for individuals to become aware of, integrate, and make adaptive use of the non-material, higher aspects of the self. This includes the psychological and existential realms, such as meaning, purpose, moral awareness, self-transcendence, and reflections on relations with others and the world (King, 2008). The proposed notion includes the individual's capacities for existential reflection, meaning, transcendence, and the intentional expansion of states of consciousness. SI, therefore, is an extension of religiosity that refers to the individual's capacity for finding meaning, integrating values, and guiding behavior by reference to deeply held ethical principles (Skrzypińska, 2021). Spirituality, therefore, is seen as an intelligence that is marked by the individual's capacity for generating meaningful, value-consistent reactions to complex life situations, such as life direction, contentment, health, and resilience (Hosaini et al., 2010). Individuals who display higher SI are able to integrate social and moral values into their behavior, such as with the environment (Alshebami et al., 2023). Research suggests that individuals with a spiritually inclined way of viewing the world are more inclined to see nature as morally significant, such as sacred, and that this is linked with environmental concern (Amel et al., 2017).

Connectedness to nature (CN) is the subjective experience of being related to nature and having feelings of identification with nature (Geng et al., 2015). It includes both affective and cognitive feelings of being part of nature. It is not merely the aesthetic experience of nature but also includes the experience of being part of nature (Wu, 2025). Research findings suggest that the level of CN is positively associated with well-being and Pro-environmental behavior (PEB) (Capaldi et al., 2014; Otto & Pensini, 2017; Pritchard et al., 2020). PEB refers to actions that seek to minimize harm to the environment or contribute to environmental protection (Lee et al., 2013). These behaviors include conservation practices, sustainable consumption, and participation in environmental initiatives. PEB is influenced by various psychological factors, including awareness of consequences, perceived behavioral control, and intrinsic motivation (Suárez-Perales et al., 2021). Within this perspective, SI represents a value-integrative cognitive capacity that enables individuals to internalize theological and moral principles in everyday decision-making.

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2
3 CN, in turn, reflects the affective and identity-based manifestation of such internalized
4 values in relation to the natural world. Examining their simultaneous associations with PEB
5 clarifies how spiritually grounded meaning-making and ecological self-identification coexist
6 within a Muslim cultural context. Although prior research has examined spirituality and pro-
7 environmental behavior (Abdullah & Keshminder, 2020; Gifford & Nilsson, 2014), relatively
8 few studies simultaneously examined SI and CN within a unified empirical framework,
9 particularly in Muslim-majority contexts, nor do they clarify how value-based cognitive
10 capacities and ecological identification operate together in relation to pro-environmental
11 engagement. Much of the existing literature focuses on general religiosity or moral values
12 without explicitly integrating SI as a measurable psychological construct. Moreover, there is a
13 scarcity of empirical investigations that directly examine the relation among these variables
14 among Muslim university students. Considering the theological emphasis on the concept of
15 stewardship, examining the relation among these variables among Muslims would be
16 theoretically meaningful as well as empirically justified.

17
18 From the Islamic point of view, the environmental problem is closely associated with
19 the theological principles that emanate from the Quran and the Hadith, as the environmental
20 problem is closely rooted in the principles of *tawhīd*, or the doctrine of the unity of God, as it
21 is closely associated with the interconnectedness of all creation as an expression of God's will.
22 The environmental problem is closely associated with the principles of *khilāfah*, or
23 stewardship, as humans are created as the trustees of the Earth, tasked with the responsibility
24 of maintaining the balance of nature, or *mīzān*, as well as the duty of avoiding corruption, or
25 *fasād* (Bakar et al., 2025; Sya'roni et al., 2025).

26
27 Islamic environmental ethics further highlight the importance of moderation
28 (*wasatiyyah*), justice, and accountability in the use of natural resources (Kurbiyanto et al.,
29 2024). The purposes of Islamic law (*maqasid al-shariah*)—particularly the preservation of life
30 and well-being—can also be extended to environmental protection (Rafique & Raza, 2026).
31 Empirical studies have found a positive relation between religiosity in Muslim-majority
32 contexts and environmental concern or pro-environmental behavior (Zafar & Abu-Hussin,
33 2025). These Islamic principles theoretically suggest that within a Muslim population,
34 spirituality can be related to environmental concern/behavior in a unique cultural context for
35 examining the relation between spirituality and the environment.

36
37 This study examines the relation among SI, CN, and PEB among Muslim university
38 students in Indonesia. More specifically, the investigation examines whether there is a
39 statistical relation between SI and PEB, as well as whether there is a statistical relation between
40 connectedness to nature and both SI and PEB within a theoretically informed structural
41 configuration. Additionally, the investigation examines whether there is a statistical mediation
42 effect of connectedness to nature on the relation between SI and PEB within a cross-sectional
43 structural model. This investigation is theoretically meaningful to the field of environmental
44 psychology by integrating the value-based cognitive ability of SI within a theological context
45 of Islam, as well as by examining the simultaneous statistical relation among the variables of
46 SI, CN, and PEB within a single structural model, as well as providing implications for faith-
47 based environmental education programs to promote environmental responsibility among
48 young adults.

Spiritual Intelligence

SI refers to the cognitive ability that helps people incorporate transcendent values, existential meanings, and ethical thinking into their cognitive processes (Amram, 2022; Skrzypińska, 2021). Unlike religiosity, SI includes the cognitive ability to make sense of life occurrences, engage in critical existential thinking, and align behaviors with strong moral principles. According to Zohar and Marshall (2001), SI refers to a cognitive model through which intellectual and emotional thinking operate, enabling people to relate their behaviors to a larger existential and value-based model. Moreover, King and DeCicco (2009) identify the following four dimensions of SI that have been widely used: critical existential thinking, personal meaning production, transcendental awareness, and conscious state expansion. These abilities enable reflective inquiry into purposes and interconnectedness, transcendent awareness, and the alignment of personal values and behavioral choices.

Emerging research findings have linked SI to ethical reasoning, empathy, moral sensitivity, and value-oriented decision-making processes (Amram, 2022; Hong, 2025). This implies that persons who are high in SI may be more disposed to incorporate moral considerations into their daily behaviors. New research findings also show the potential relation that exists between SI and ecological awareness. The capacity to transcend and the meaning that emphasizes interconnectedness may theoretically extend beyond the interpersonal to include the natural world as a whole (Echarri-Iribarren & Echarri-Iribarren, 2021; Mušinović, 2020). Even though there is limited research that has examined the relation that exists between SI and PEB, especially among the Muslim population, the theological focus on moral accountability provides a theoretically relevant foundation to explore such a relation.

Connectedness to Nature

CN is the psychological and affective construct that characterizes an individual's feeling of belonging to the natural world (Mayer & Frantz, 2004). It has been described as the extent to which an individual incorporates nature into their self-concept, such that it includes their emotional affiliations, cognitive identifications, and experiential immersions in ecological systems. It has been considered a relatively stable individual difference variable that reflects the extent to which an individual perceives themselves as connected to the natural world. The scientific literature has consistently demonstrated a positive relation between CN and environmental concern, supporting the construct as a central psychological construct in the investigation of ecological orientation (Mikusiński et al., 2023; Navarro et al., 2017). Research has demonstrated that CN appears to be associated with meaningful experiences in natural environments. Repetitive and emotionally evocative experiences of nature, both in naturalistic situations and in the context of nature-based activities, have been shown to be associated with stronger perceptions of connectedness to nature (Garza-Terán et al., 2022; Richardson et al., 2022). Emotional experiences of awe, tranquility, fascination, etc., have been shown to be particularly relevant to the experience of connectedness to nature, as these emotions have the potential to facilitate a sense of interconnectedness and belonging.

In the context of the escalating global sustainability agenda, CN has emerged as a salient psychological predictor of pro-environmental engagement. Individuals with higher levels of CN have demonstrated a higher level of receptiveness to nature conservation practices,

sustainable consumption patterns, and environmental activism (Mikusiński et al., 2023). These findings have demonstrated that CN has a basis beyond cognitive processes, as the relation between CN and pro-environmental engagement appears to be linked to the affective and experiential dimensions of the individual's connections with nature, which gives rise to the development of an ecological identity. The relation between CN and higher-level value-based capacities, such as SI, has yet to be explored, particularly in the context of religious and culturally-specific groups. The relation between CN and the Muslim population would be of considerable interest as a means of gaining a deeper understanding of the relation between affective ties to nature and the capacity to engage in spiritually informed meaning-making capacities.

Pro-Environmental Behavior

PEB consists of behaviors intentionally directed towards minimizing environmental damage and/or fostering ecological sustainability (Sun et al., 2023; Wan & Du, 2022). PEB can occur in both public and personal spheres. Personal PEB consists of personal behaviors, while public PEB includes civic participation and environmental advocacy. Although these behaviors differ, both types of PEB contribute to the development of sustainability through the accumulation of behavior and normative influences in the community. Theoretically, PEB has been explained by the integrated cognitive, moral, and identity factors of behavior. The Theory of Planned Behavior (TPB) suggests that cognitive factors such as attitudes, subjective norms, and perceived control over behavior are associated with behavior intention and behavior (Ajzen, 1991). Apart from cognitive factors, personal norms based on moral responsibility and environmental self-identity have been strongly linked to environmental engagement. People whose self-identities incorporate environmental responsibility as a moral obligation have a higher probability of displaying PEB consistently, regardless of the context (Udall et al., 2021).

Current literature is increasingly focusing on the importance of the impact of deeper value-based and existential orientations in the facilitation of sustainable behavior. PEB may be understood as value-consistent behavior, which is in line with the beliefs and moral values of an individual. This is in the sense that PEB is not only motivated by extrinsic factors but also involves the internal value system and moral values of the individual in question. In this case, deeper psychological capabilities such as SI, which is the ability to integrate values and create existential meaning, and affective ecological identification, such as the sense of CN, may be linked to PEB in such a manner that the study of these links may help in the understanding of the interplay of the internal value system and the sense of CN in the facilitation of PEB.

Interrelation between SI, CN, and PEB

The antecedents of PEB from spiritual and psychological approaches have received growing research attention to further elucidate the underlying factors promoting such behavior. From the perspective of environmental psychology, two constructs—SI and CN—emerged as complementary approaches to understanding the relation between the two. Specifically, SI pertains to the value-based and existential meaning-making and ethical integration process, while CN pertains to the affective and identity-based nature of affiliation. Examining the concurrent relation between the two constructs could provide further insights into the co-occurring association between moral frameworks and nature affiliation in the context of PEB.

CN has consistently shown concurrent relation with environmental concern and PEB across different cultural groups (Geng et al., 2015; Guazzini et al., 2025). Individuals with higher CN tend to support and practice nature conservation and activism. Previous research has also established CN as an intervening variable in the context of psychological approaches to understanding PEB. Specifically, the study found that CN could potentially serve as the psychological bridge between values and experiences and PEB through the formation of ecological identification (Diessner et al., 2018; Rosa et al., 2018). Collectively, these findings situate CN as a psychological bridge linking values and experiences with environmental engagement.

While CN is essentially linked to affective ecological identification, the concept of SI adds an existential and ethical dimension to this. As part of the broader interdisciplinary discourse on ecology, theology, and the sociology of religion, the term "ecospirituality" has already been used to refer to the integration of ecological and spiritual meaning-making. Instead of referring to a specific and unified theory, the term "ecospirituality" seems to refer to the broad range of perspectives in which ecological concerns are embedded in spiritual and transcendental worldviews. As part of the organizational context, ecospirituality has been referred to by Onubi (2024) in the context of the integration of spiritual and ecological concerns, particularly with regard to voluntary approaches to environmental responsibility. SI includes the ability to make meaning, to recognize interconnectedness, and to exercise moral values in decision-making. Empirical studies have shown that individuals with a spiritually oriented value orientation tend to have higher levels of intrinsic motivation and value-based commitment to ecological responsibility (Afsar et al., 2016). This application does not create a new construct but rather illustrates the manner in which spirituality-based value systems may correspond to ecological commitments in specific contexts.

Current study

Current empirical results also indicate that spirituality-related constructs relate to CN and PEB (Rezapouraghdam et al., 2018). Breaking from the deterministic model, the present study employs a theoretically derived mediation model in which CN is statistically controlled as a mediator in the relation between SI and PEB. Here, SI is conceptualized as a value-based cognitive ability, CN as an affective ecological identification, and PEB as a behavioral expression. Expanding from this synthesis, a partial mediation model is offered, as in Figure 1 below.

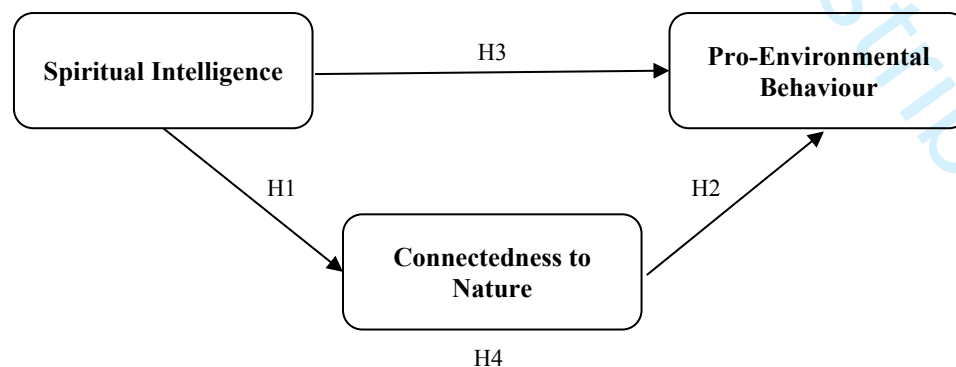


Figure 1. *Conceptual model underlying the study*

As depicted in Figure 1, the model specifies both direct and indirect pathways. A direct path from SI to PEB is proposed, alongside an indirect path through CN, reflecting a partial mediation structure. Accordingly, the hypotheses guiding this study are as follows:

H1: SI is positively associated with CN.

H2: CN is positively associated with PEB.

H3: SI is positively associated with PEB.

H4: CN statistically mediates the association between SI and PEB

Method

Research Design

This study employed a quantitative cross-sectional survey design to examine the relation among SI, CN, and PEB. Structural Equation Modeling (SEM) was used to estimate the hypothesized structural association among the latent constructs (Hair et al., 2021). Prior to structural modeling, Rasch analysis was conducted to improve the measurement properties of the Likert-type data (Bond & Fox, 2015).

Participants and Sampling

Data were collected through an online questionnaire. Participation was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were ensured, and the study adhered to established research ethics standards. The study used non-probability convenience sampling based on the inclusion criterion of being an actively enrolled undergraduate student at an Indonesian university. A total of 251 students participated. The sample consisted of 69.38% female ($n = 179$) and 30.62% male ($n = 79$). As regards the year of study, 22.48% were first-year students, 6.58% second-year, 33.72% third-year, and 37.20% fourth-year students who completed their final projects. Despite convenience sampling's generalizability limits, it allows exploration of association patterns within the defined society (Creswell & Creswell, 2018).

Instruments

All constructs were measured using previously validated Likert-type scales. SI was measured using the Spiritual Intelligence Self-Report Inventory (SISRI-24) formulated by King and DeCicco (2009). The instrument includes four dimensions: critical existential thinking, personal meaning making, transcendental awareness, and conscious state expansion. However, after conducting the Rasch misfit analysis, the scale was reduced to 23 items. CN was measured using the Connectedness to Nature Scale developed by Mayer and Frantz (2004), consisting of 14 items assessing individuals' emotional and experiential connection with the natural environment. PEB was measured using the Pro-Environmental Behavior Scale developed by Mateer et al. (2022), capturing behaviors in private and public sustainability domains. All instruments were conducted using Likert-type response formats through Google Forms.

Data Analysis

The data analysis was done in various stages. First, descriptive statistics were

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calculated, followed by the application of the Rasch analysis, which converts ordinal Likert scales into interval data based on the principles of item response theory. The Rasch model is useful for the concurrent estimation of person measures and item difficulties, thus providing more precise measurements (Yan & Cheng, 2015). The psychometric analysis includes person reliability, item reliability, infit, outfit, explained variance, and category-functioning statistics. Third, Pearson correlation analysis was performed to examine preliminary bivariate associations among SI, CN, and PEB. Finally, Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS software. PLS-SEM was selected due to its suitability for complex models and moderate sample sizes (Hair et al., 2021).

The measurement (outer) model was evaluated by examining outer loadings, composite reliability (CR), average variance extracted (AVE), and the Heterotrait–Monotrait (HTMT) ratio to assess convergent and discriminant validity. The structural (inner) model was assessed by analyzing path coefficients, their statistical significance using bootstrapping with 5,000 resamples, and R^2 values to evaluate explanatory power (Hair et al., 2021). For mediation analysis, the indirect effect of SI on PEB through CN was tested using bias-corrected bootstrapping procedures. Mediation was supported when the 95% confidence interval of the indirect effect did not include zero (Hayes, 2022).

Results

Psychometric Properties of the measurement scales

Rasch analysis was conducted to evaluate psychometric properties on the SI, CN, and PEB instruments. Table 1 below explains the result of the analysis, ensuring the robustness of measurement scales in order to ensure data reliability and validity are employed while testing the proposed model.

Table 1: Psychometric Properties of Measurement Scale

Scale	No. of Items	Rasch person/item Reliability	Rasch person/item separation indices	Variance Explained by Measures	Andrich Threshold			
					1	2	3	4
SI	23	0.91/0.97	3.18/5.38	42.7%	-2.16	-1.26	0.82	2.60
CNS	14	0.75/0.99	1.75/8.47	45.1%	-1.56	-0.87	0.54	1.88
PEB	14	0.77/0.98	1.85/7.55	45.1%	-2.75	-0.90	0.73	2.92

As reported in Table 1, the Rasch person and item reliability coefficients indicated acceptable internal consistency and stable item calibration across all three instruments. Furthermore, the separation indices corroborated that the items separated well along the latent continuum, with the variance explained by measure demonstrating a high ratio of response variance attributed to the constructs. Category threshold estimates showed an ordered progression for all response categories, suggesting appropriate functioning of the five-point Likert scale.

Descriptive statistics

Descriptive statistics based on Rasch person measures were calculated to examine the distribution of SI, CN, and PEB as presented in Table 2. The determination of respondent levels

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was conducted based on the person-measure distribution using the mean and standard deviation approach. Respondents are categorized as low category if they have a score below the mean – 1 SD, moderate category if they are in the range of the mean \pm 1 SD, and high category if they have a score above the mean + 1 SD. This approach allows grouping individuals based on their relative position on the latent construct continuum.

Table 2: Distribution of Respondents' Levels based on Rasch Person Measure

Variable	Mean	SD	Low n (%)	Moderate n (%)	High n (%)
Spiritual Intelligence	1.30	0.28	113 (45%)	37 (15%)	101 (40%)
Connectedness to Nature	0.77	0.58	45 (18%)	148 (59%)	58 (23%)
Pro-Environmental Behavior	0.11	0.70	40 (16%)	169 (67%)	42 (17%)

N = 251. Note: Rasch-transformed logit scores used. ** $p < .01$

As presented in Table 2, the distribution reveals variation across the three constructs. The distribution of SI is relatively dispersed across categories with respondents predominantly grouped into the low and high category. On the other hand, the majority of respondents fell into the moderate category for both CN and PEB.

Correlation between Variables

The correlation analysis was conducted to examine the bivariate relation between SI, CN, and PEB. Correlations were calculated based on latent construct scores estimated using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. The correlation matrix between variables is presented in Table 3.

Table 3: Correlation Matrix Between Research Variables

Variable	r_1	r_2	r_3
Spiritual Intelligence	-		
Connectedness to Nature	0.576**	-	
Pro-Environmental Behavior	0.412**	0.425	-

N = 251. Note: ** $p < 0.01$

Table 3 summarizes that regarding the intercorrelations among the constructs. The results indicate strong, positive, and statistically significant associations among SI, CN, and PEB, providing preliminary empirical support for the proposed structural model and therefore must be further investigated using PLS-SEM analysis.

Structural Model Evaluation and Hypotheses Testing

This section presents the results of the structural model analysis examining the hypothesized associations among SI, CN, and PEB. Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS. Statistical significance was assessed through bootstrapping with 5,000 resamples. The structural model and path coefficients are presented in Figure 2.

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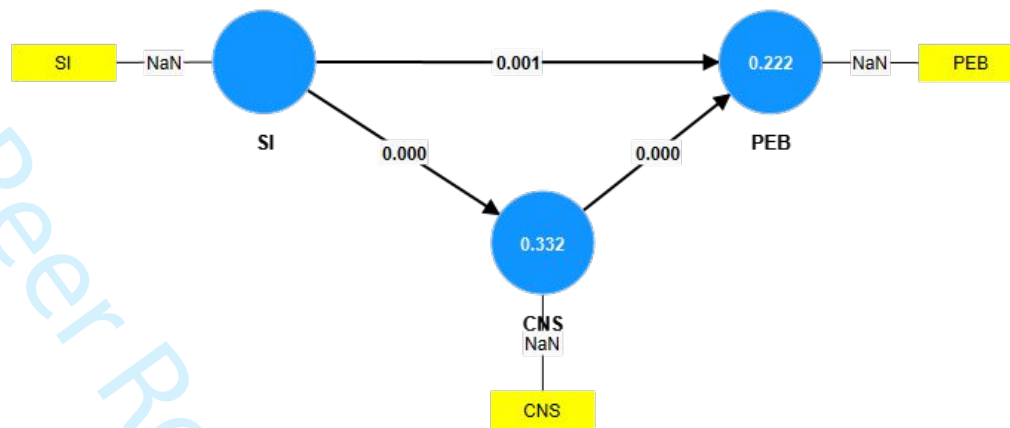


Figure 2. Structural Model of the Interrelation between SI, CN, and PEB

The structural model evaluated in Figure 2 demonstrates that SI and CNS account for a meaningful proportion of the variance in PEB. Furthermore, as presented in Table 4, the path analysis reveals that SI has a positive and significant direct relationship with both CNS and PEB. CNS also demonstrates a positive and significant relationship with PEB. Consequently, Hypotheses 1, 2, and 3 are fully supported.

Table 4: Structural Model Path Coefficients

Path	Original Sample (O)	Sample Mean (M)	STDEV	T-value	P-value	Decision
CNS → PEB	0.280	0.280	0.062	4.526	<0.001	Supported
SI → CN	0.576	0.579	0.041	13.960	<0.001	Supported
SI → PEB	0.251	0.252	0.073	3.418	<0.001	Supported

The results indicate that SI is positively and significantly related to CN, providing support for hypothesis 1. CN is also positively associated with PEB, thereby supporting hypothesis 2. In addition, SI demonstrates a significant direct relation with PEB, confirming hypothesis 3. Following these findings, an indirect-effect analysis was conducted to examine the mediating role of connectedness to nature in the relation between SI and PEB. The detailed results of the indirect effect are presented in Table 5.

Table 5: Specific Indirect Relation on the Mediation of CN in SI and PEB Interrelation

Path	Original Sample (O)	Sample Mean (M)	STDEV	T-value	P-value	Decision
SI → CN → PEB	0.161	0.162	0.038	4.267	<0.001	Supported

As detailed in Table 5, the analysis demonstrates a statistically significant indirect association. This finding supports Hypothesis 4, indicating that CN partially mediates the relationship between SI and PEB. Although the structural model specifies theoretically directional paths, the cross-sectional design does not allow conclusions regarding temporal precedence or causality. The reported coefficients therefore reflect statistically significant associations within the proposed model structure.

Discussion

The psychometric analysis shows that the tools used to measure the levels of SI, CN, and PEB have high quality in the current sample population. The high reliability coefficient and smooth response patterns indicate that the participants understood the tools well, providing a good basis to examine the relation observed (Bond & Fox, 2015). The analysis shows that there was a positive inter-correlation association between SI, CN, and PEB. In summary, students with higher levels of SI reported a stronger sense of belonging to nature as well as a higher frequency of PEB. It is worth noting that CN acts as a mediator in the relation between spiritual values and environmental behavior. Although the findings have statistical significance, it is worth noting that the relation observed is only associative in nature.

The positive link between SI and CN is consistent with Islamic principles of environmental ethics. *Tawhid* (the unity of God), *Khalifah* (stewardship), and *Mizan* (balance) are principles that offer a framework through which nature is perceived as a divine order (Mangunjaya & McKay, 2012). For Indonesian students, SI may mean a theological imagination of nature as a sacred relational other. This understanding of SI resonates with Muralidharan et al.'s study (2024), which suggests that spiritual beliefs give rise to an ecologically conscious psychology. In such a worldview, SI rekindles a pre-existing spiritual connection through which caring for the environment becomes a way of affirming God's existence through His signs (*Ayatullah*).

The findings also confirm that CN is a significant correlate of PEB, echoing a substantial body of research (Guazzini et al., 2025; Mayer & Frantz, 2004). CN involves an ontological change in which the individual incorporates nature into their self-schema. This interpretation is supported in the Indonesian context through the notion of *mizan*, whereby the maintenance of ecological equilibrium is perceived as the will of God and therefore is an integral part of one's moral responsibility. This emotional and relational dimension is important because, as Pasca (2022) has argued, emotions such as feelings of pride and guilt often mediate the interrelation between CN and behavior. Furthermore, the results suggest that CN is an important determinant of moral identity. As Keith et al. (2022) have noted, CN is related to an environmental self-identity, which in turn drives individuals to behave in accordance with their pro-environmental values. While the present study does not assess childhood experiences, the strength of the CN-PEB relation is in line with the literature suggesting that early exposure to nature is likely to shape ecological behavior in adulthood (Rosa et al., 2018).

The results thus validate the assumption of the importance of CN as a predictor of PEB, as reinforced in the literature on the topic (Zohar & Marshall, 2001; Amram, 2022). In the case of Muslim youth, environmentalism is commonly an expression of ecological piety in which PEB is considered an essential component of *maqashid al-shari'ah* (the higher objectives of Islamic law). This thus validates the assumption of the role of spirituality in the promotion of sustainable behaviors through the promotion of spiritual well-being in individuals (Fisher & Ng, 2017). The Indonesian context, for instance, is noteworthy for the promotion of such internal aspects of spirituality through initiatives such as the Eco-Pesantren program (Mangunjaya & McKay, 2012). In such contexts, environmentalism is no longer just about compliance with top-down regulatory frameworks but is an essential component of one's spirituality. This is not surprising, as Luetz and Nunn (2023) noted the stronger influence of

spirituality on sustainable behaviors in cultures in which spirituality informs the broader discourse on morality.

Throughout all of these studies, however, there exists a multi-layered framework wherein SI informs worldview and meaning-making structures, CN translates these worldview structures into experiential realities, and PEB emerges as its behavioral correlate. Rather than considering SI and CN as distinct predictors of PEB, they are seen as a synergistic complex of values and emotional states (Merlo et al., 2025). This suggests that interventions designed to promote sustainability must move beyond external factors such as policy and reward systems and focus on inner development as a critical factor (Barbaro & Pickett, 2016). For example, mindfulness-based interventions or religious education that places a strong emphasis on active attention to nature may be more effective in producing long-term behavioral habits than purely informational-based ones. interventions (Richardson et al., 2022). These findings have significant implications for understanding the complex cognitive and emotional processes that underlie environmentally sustainable behavioral responses.

Implication of the Study

This current study also contributes to the fields of environmental psychology and sustainability research, particularly through the exploration of the combined association between SI and CN and their relation to PEB in a university setting where the student population was predominantly Muslim. The results of this current study add to the existing body of knowledge on the topic of PEB through the exploration of the potential role of the ethical and meaningful aspects of environmental behaviors. The significant relation between SI and PEB suggests that the integration of values based on spirituality may play a role in environmental decision-making, which aligns with the majority of the existing research on the topic but was conducted from an organizational rather than a university setting. The significant association between CN and PEB was consistent with the majority of the environmental psychology literature that also found this relation to be significant. The current study found that the relation between SI and PEB was mediated by CN, which suggests that the cognitive-moral and affective ecological identification aspects of environmental behaviors may be present together but does not suggest that one comes before the other. From a practical perspective, the current study suggests that there may be potential benefits to the inclusion of values-based approaches to environmental behaviors, as well as experiential approaches to nature, in the design of environmental programs in a university setting.

Limitation of Study

Despite the study's contributions, the present study has several limitations. First, the study is cross-sectional in nature and does not allow causal inference. While the partial least squares structural equation modeling (PLS-SEM) model is theoretically derived to have causal paths, the study does not allow the assessment of causality in the model, and reverse models are also possible. Second, the study relied on self-report measures to assess the construct, which may have limitations in the form of common method variance and social desirability bias. Third, the study relied on convenience sampling from Indonesian students and may not generalize to the larger population. Fourth, although the model has been supported and has predictive validity in the form of variance in connectedness to nature and pro-environmental

behavior, several other factors may have been included to further understand the phenomenon, such as environmental knowledge, perceived behavioral control, and institutional factors.

Conclusion

This study aimed to examine the relation between SI, CN, and PEB among Indonesian university students using the PLS-SEM approach, guided by the proposed theoretical model. The reliability and validity of the instruments were established using the Rasch analysis, indicating that the transformed scores exhibited good reliability and validity. The proposed theoretical model was supported by the finding that SI was positively related to PEB, while connectedness to nature was also positively related to pro-environmental behavior. Further, the mediation analysis revealed that CN partially mediated the relation between SI and PEB. The present study suggests that cognitive-moral abilities and affective ecological identification may coexist as part of the broader sustainability orientation. Although the present study has some limitations, the results of the present study may contribute to the discourse on environmental psychology by highlighting the potential importance of spiritually informed meaning-making and nature identification for sustainability-oriented approaches. Further research is needed to clarify the interrelation between the constructs of the present study.

References

- Abdullah, M. S., & Keshminder, J. S. (2020). Religion and pro-environmental behaviour: A comparative analysis towards environmental protection. *International Journal of Environment and Sustainable Development*, 19(2), 174. <https://doi.org/10.1504/IJESD.2020.106662>
- Abumoghli, I. (2023). The role of religions, values, ethics, and spiritual responsibility in environmental governance and achieving the sustainable development agenda. *Religion and Development*, 2(3), 485–495. <https://doi.org/10.30965/27507955-20230008>
- Afsar, B., Badir, Y., & Kiani, U. S. (2016). Linking spiritual leadership and employee pro-environmental behavior: The influence of workplace spirituality, intrinsic motivation, and environmental passion. *Journal of Environmental Psychology*, 45, 79–88. <https://doi.org/10.1016/j.jenvp.2015.11.011>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Alshebami, A. S., Alholiby, M. S., Elshaer, I. A., Sobaih, A. E. E., & Al Marri, S. H. (2023). Examining the relationship between green mindfulness, spiritual intelligence, and environmental self identity: Unveiling the path to green entrepreneurial intention. *Administrative Sciences*, 13(10), 226. <https://doi.org/10.3390/admsci13100226>
- Amel, E., Manning, C., Scott, B., & Koger, S. (2017). Beyond the roots of human inaction: Fostering collective effort toward ecosystem conservation. *Science*, 356(6335), 275–279. <https://doi.org/10.1126/science.aal1931>
- Amram, Y. J. (2022). The intelligence of spiritual intelligence: Making the case. *Religions*, 13(12), 1140. <https://doi.org/10.3390/rel13121140>
- Bakar, S. A., Hussin, H., Rozani, M. A. S., & Ahmad, Z. A. S. (2025). Environmental ethics in the Qur'an: A thematic analysis of conservation and stewardship. *Global Journal Al-Thaqafah*, 31–45. <https://doi.org/10.7187/GJATSI122025-3>
- Barbaro, N., & Pickett, S. M. (2016). Mindfully green: Examining the effect of connectedness to nature on the relationship between mindfulness and engagement in pro-environmental behavior. *Personality and Individual Differences*, 93, 137–142. <https://doi.org/10.1016/j.paid.2015.05.026>
- Bond, T., & Fox, C. M. (2015). *Applying the Rasch Model: Fundamental measurement in the human science, Thrid edition* (3rd ed.). Routledge. <https://doi.org/10.4324/9781315814698>
- Capaldi, C. A., Dopko, R. L., & Zelenski, J. M. (2014). The relationship between nature connectedness and happiness: A meta-analysis. *Frontiers in Psychology*, 5. <https://doi.org/10.3389/fpsyg.2014.00976>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (Fifth edition). SAGE.
- Diessner, R., Genthôs, R., Praest, K., & Pohling, R. (2018). Identifying with nature mediates the influence of valuing nature's beauty on proenvironmental behaviors. *Ecopsychology*, 10(2), 97–105. <https://doi.org/10.1089/eco.2017.0040>
- Echarri-Iribarren, F., & Echarri-Iribarren, V. (2021). Environmental education and ecological spiritual intelligence: The case of Basque mythology. *Australian Journal of Environmental Education*, 37(2), 120–131. <https://doi.org/10.1017/ae.2020.33>

- 1
2
3 Fisher, J., & Ng, D. (2017). Presenting a 4-Item Spiritual Well-Being Index (4-ISWBI).
4 *Religions*, 8(9), 179. <https://doi.org/10.3390/rel8090179>
5
6 Garza-Terán, G., Tapia-Fonllem, C., Fraijo-Sing, B., Borbón-Mendivil, D., & Poggio, L.
7 (2022). Impact of contact with nature on the wellbeing and nature connectedness
8 indicators after a desertic outdoor experience on Isla Del Tiburon. *Frontiers in*
9 *Psychology*, 13, 864836. <https://doi.org/10.3389/fpsyg.2022.864836>
10
11 Geng, L., Xu, J., Ye, L., Zhou, W., & Zhou, K. (2015). Connections with nature and
12 environmental behaviors. *PLOS ONE*, 10(5), e0127247.
13 <https://doi.org/10.1371/journal.pone.0127247>
14
15 Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental
16 concern and behaviour: A review. *International Journal of Psychology*, n/a-n/a.
17 <https://doi.org/10.1002/ijop.12034>
18
19 Guazzini, A., Valdrighi, G., Fiorenza, M., & Duradoni, M. (2025). The relationship between
20 connectedness to nature and Pro-environmental behaviors: A systematic review.
21 *Sustainability*, 17(8), 3686. <https://doi.org/10.3390/su17083686>
22
23 Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial*
24 *Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*.
25 Springer International Publishing. <https://doi.org/10.1007/978-3-030-80519-7>
26
27 Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis:*
28 *A regression-based approach* (Third edition). The Guilford Press.
29
30 Hong, T. K. (2025). *The imperative of business ethics and the role of spiritual intelligence in*
31 *enhancing ethical thinking in the workplace*. Unpublished.
32 <https://doi.org/10.13140/RG.2.2.30732.63363>
33
34 Hosaini, M., Elias, H., Krauss, S. E., & Aishah, S. (2010). A review study on spiritual
35 intelligence, adolescence and spiritual intelligence, factors that may contribute to
36 individual differences in spiritual intelligence, and the related theories. *International*
37 *Journal of Psychological Studies*, 2(2), p179. <https://doi.org/10.5539/ijps.v2n2p179>
38
39 Ibáñez-Rueda, N., Guillén-Royo, M., & Guardiola, J. (2020). Pro-environmental behavior,
40 connectedness to nature, and wellbeing dimensions among Granada students.
41 *Sustainability*, 12(21), 9171. <https://doi.org/10.3390/su12219171>
42
43 Keith, R. J., Given, L. M., Martin, J. M., & Hochuli, D. F. (2022). Environmental self-identity
44 partially mediates the effects of exposure and connection to nature on urban children's
45 conservation behaviours. *Current Research in Ecological and Social Psychology*, 3,
46 100066. <https://doi.org/10.1016/j.cresp.2022.100066>
47
48 King, D. B. (2008). *Rethinking claims of spiritual intelligence: A definition, model, and*
49 *measure* [Master Degree program, Trent University].
50 <https://api.semanticscholar.org/CorpusID:146499861>
51
52 King, D. B., & DeCicco, T. L. (2009). A viable model and self-report measure of spiritual
53 intelligence. *International Journal of Transpersonal Studies*, 28(1), 68–85.
54 <https://doi.org/10.24972/ijts.2009.28.1.68>
55
56 Kurbiyanto, A., Yusmaliana, D., Fitriana, F., Altiarika, E., & Sabri, F. (2024). Environmental
57 ethics in Islamic teachings: Discussing ethical principles in Islamic teachings that
58 emphasize environmental protection and preservation. In A. Sharifi, J. L. Candelaria,
59 D. Simangan, & S. Kaneko (Eds.), *Navigating Peace and Sustainability in an*
60

- Increasingly Complex World* (pp. 15–34). Springer Nature Singapore. https://doi.org/10.1007/978-981-97-8772-2_2
- Lee, T. H., Jan, F.-H., & Yang, C.-C. (2013). Conceptualizing and measuring environmentally responsible behaviors from the perspective of community-based tourists. *Tourism Management*, *36*, 454–468. <https://doi.org/10.1016/j.tourman.2012.09.012>
- Luetz, J. M., & Nunn, P. D. (2023). Spirituality and sustainable development: An entangled and neglected relationship. *Sustainability Science*, *18*(4), 2035–2042. <https://doi.org/10.1007/s11625-023-01347-8>
- Mangunjaya, F. M., & McKay, J. E. (2012). Reviving an Islamic Approach for Environmental Conservation in Indonesia. *Worldviews*, *16*(3), 286–305. <https://doi.org/10.1163/15685357-01603006>
- Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, *24*(4), 503–515. <https://doi.org/10.1016/j.jenvp.2004.10.001>
- Merlo, G., Pereira-Sanchez, V., Lee, W., Wong, William T., & Morales, M. J. (2025). Connectedness as a mental health pillar: To self, others, and the world. *Psychiatric Annals*, *55*(7). <https://doi.org/10.3928/00485713-20250613-03>
- Mikusiniński, G., Elbakidze, M., Orlikowska, E. H., Skaltsa, I. G., Żmihorski, M., & Iwińska, K. (2023). Elucidating human–nature connectedness in three EU countries: A pro-environmental behaviour perspective. *People and Nature*, *5*(5), 1577–1591. <https://doi.org/10.1002/pan3.10523>
- Muralidharan, S., La Ferle, C., & Roth-Cohen, O. (2024). How religiosity and spirituality influences the ecologically conscious consumer psychology of Christians, the non-religious, and atheists in the United States. *Archive for the Psychology of Religion*, *46*(1), 71–87. <https://doi.org/10.1177/00846724231225674>
- Mušinović, F. (2020). Spiritual intelligence and business environments. *Academica Turistica*, *13*(2), 167–177. <https://doi.org/10.26493/2335-4194.13.167-177>
- Navarro, O., Olivos, P., & Fleury-Bahi, G. (2017). “Connectedness to nature scale”: Validity and reliability in the French context. *Frontiers in Psychology*, *8*, 2180. <https://doi.org/10.3389/fpsyg.2017.02180>
- Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*, 88–94. <https://doi.org/10.1016/j.gloenvcha.2017.09.009>
- Pasca, L. (2022). Pride and guilt as mediators in the relationship between connection to nature and pro-environmental intention. *Climatic Change*, *175*(1–2), 5. <https://doi.org/10.1007/s10584-022-03458-0>
- Pritchard, A., Richardson, M., Sheffield, D., & McEwan, K. (2020). The relationship between nature connectedness and eudaimonic well-being: A meta-analysis. *Journal of Happiness Studies*, *21*(3), 1145–1167. <https://doi.org/10.1007/s10902-019-00118-6>
- Rafique, M. O., & Raza, K. M. (2026). Islamic green finance. In E. Smolo & M. O. Rafique (Eds.), *Islamic green finance: A marriage of ethics and environmental responsibility in light of Maqasid al-Shari'ah*. Routledge. <https://doi.org/10.4324/9781003540403>

- 1
2
3 Rezapouraghdam, H., Alipour, H., & Darvishmotevali, M. (2018). Employee workplace
4 spirituality and pro-environmental behavior in the hotel industry. *Journal of*
5 *Sustainable Tourism*, 26(5), 740–758. <https://doi.org/10.1080/09669582.2017.1409229>
6
7 Richardson, M., Hamlin, I., Butler, C. W., Thomas, R., & Hunt, A. (2022). Actively noticing
8 nature (not just time in nature) helps promote nature connectedness. *Ecopsychology*,
9 14(1), 8–16. <https://doi.org/10.1089/eco.2021.0023>
10
11 Rosa, C. D., Profice, C. C., & Collado, S. (2018). Nature experiences and adults' self-reported
12 pro-environmental behaviors: The role of connectedness to nature and childhood nature
13 experiences. *Frontiers in Psychology*, 9, 1055.
14 <https://doi.org/10.3389/fpsyg.2018.01055>
15
16 Skrzypińska, K. (2021). Does spiritual intelligence (SI) exist? A theoretical investigation of a
17 tool useful for finding the meaning of life. *Journal of Religion and Health*, 60(1), 500–
18 516. <https://doi.org/10.1007/s10943-020-01005-8>
19
20 Suárez-Perales, I., Valero-Gil, J., Leyva-de La Hiz, D. I., Rivera-Torres, P., & Garcés-Ayerbe,
21 C. (2021). Educating for the future: How higher education in environmental
22 management affects pro-environmental behaviour. *Journal of Cleaner Production*, 321,
23 128972. <https://doi.org/10.1016/j.jclepro.2021.128972>
24
25 Sun, J., Ma, B., & Wei, S. (2023). Same gratitude, different pro-environmental behaviors?
26 Effect of the dual-path influence mechanism of gratitude on pro-environmental
27 behavior. *Journal of Cleaner Production*, 415, 137779.
28 <https://doi.org/10.1016/j.jclepro.2023.137779>
29
30 Sya'roni, Mokh., Nor Ichwan, Moh., Pratama, M. Y., & Ming, D. (2025). Ecotheological
31 insights from prophetic hadiths: Reframing Islamic environmental ethics based on
32 SDGs. *Pharos Journal of Theology*, (106.5). <https://doi.org/10.46222/pharosjot.106.51>
33
34 Udall, A. M., De Groot, J. I. M., De Jong, S. B., & Shankar, A. (2021). How I see me—A meta-
35 analysis investigating the association between identities and pro-environmental
36 behaviour. *Frontiers in Psychology*, 12, 582421.
37 <https://doi.org/10.3389/fpsyg.2021.582421>
38
39 Wan, Q., & Du, W. (2022). Social capital, environmental knowledge, and pro-environmental
40 behavior. *International Journal of Environmental Research and Public Health*, 19(3),
41 1443. <https://doi.org/10.3390/ijerph19031443>
42
43 Wu, J. (2025). Green mind, healthy mind: Investigating nature's role in students' health-related
44 quality of life in China. *BMC Psychology*, 13(1), 334. <https://doi.org/10.1186/s40359-025-02609-z>
45
46 Wynes, S., & Nicholas, K. A. (2017). The climate mitigation gap: Education and government
47 recommendations miss the most effective individual actions. *Environmental Research*
48 *Letters*, 12(7), 074024. <https://doi.org/10.1088/1748-9326/aa7541>
49
50 Yan, Z., & Cheng, E. C. K. (2015). Primary teachers' attitudes, intentions and practices
51 regarding formative assessment. *Teaching and Teacher Education*, 45, 128–136.
52 <https://doi.org/10.1016/j.tate.2014.10.002>
53
54 Zafar, M. B., & Abu-Hussin, M. F. (2025). Faith, growth, and ethics: Cross-cultural analysis
55 of religiosity and environment protection vis-a-vis economic priorities among Muslims.
56 *Journal of Environmental Psychology*, 106, 102716.
57 <https://doi.org/10.1016/j.jenvp.2025.102716>
58
59
60

SPIRITUAL INTELLIGENCE FOSTERS GREEN ACTIONS

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1
2
3 Zohar, D., & Marshall, I. (2001). *Spiritual intelligence: The ultimate intelligence*. Bloomsbury
4 Publishing Plc.
5
6
7
8
9
10
11
12
13
14
15
16
17
18
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Spiritual Intelligence Fosters Green Actions: The Role of Nature Connectedness in Shaping Pro-Environmental Behavior

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Abstract

This study ~~aims to examine~~ examines the ~~relation between relations among~~ spiritual intelligence (SI), connectedness to nature (CN), and pro-environmental behavior (PEB) ~~amongin~~ a sample of 251 Indonesian university students. ~~The study employed~~ Employing a cross-sectional ~~research~~ design, ~~wherethe study utilized~~ a two-step ~~analytical~~ approach involving Rasch analysis ~~and to validate scale reliability and~~ Partial Least Squares Structural Equation Modeling (PLS-SEM) ~~was used for to test~~ the analysis ~~structural model~~. Rasch analysis ~~validates confirmed~~ the reliability and validity ~~robustness~~ of the SI, CN, and PEB ~~scales~~. ~~The descriptive instruments, continuing the transformation of raw data into logit scores. Descriptive~~ and correlational ~~analyses show results indicated~~ moderate positive ~~eorrelations associations~~ among the three constructs. ~~These findings provide preliminary evidence for the theoretically proposed relations among the constructs. The results of the PLS-SEM analysis show revealed~~ a positive relation between SI and PEB ($\beta = .251, p < .001$) ~~as well as and~~ a strong relation between SI and CN ($\beta = .576, p < .001$). ~~In addition, a positive relation is also found between~~ Additionally, CN ~~and was positively related to~~ PEB ($\beta = .280, p < .001$). The mediation analysis also ~~reveals a partial mediation effect of indicated that~~ CN ~~on partially mediates~~ the relation between SI and PEB. ~~The results show, suggesting that SI is positively related relates~~ to PEB ~~green action~~ through a ~~heightened level of ecological~~ connectedness to nature. The ~~results also show model explained~~ a moderate level of ~~explained variance for both constructs included in the model~~ ($R^2 = .332$ for CN; $R^2 = .222$ for PEB). ~~The results also show a moderate level of) with adequate~~ predictive relevance for the model. Theoretically, this study ~~contributes to the literature on integrates SI into~~ environmental psychology ~~by incorporating the concept of SI into the field. From a practical perspective, this study emphasizes the importance of developing SI to foster PEB literature. Practically, the findings emphasize the role of spiritual reflection and nature connectedness in fostering sustainable behaviors among Indonesian youth.~~

Keywords: spiritual intelligence, nature connectedness, pro-environmental behavior, sustainability, Rasch analysis, PLS-SEM.

Introduction

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Spiritual Intelligence Fosters Green Actions: The Role of Nature Connectedness in Shaping Pro-Environmental Behavior

In recent decades, environmental sustainability has become an important global concern, especially with the rise of environmental issues such as increased climate change, biodiversity loss, and environmental degradation (Ibáñez-Rueda et al., 2020; Wynes & Nicholas, 2017). Although the environmental problem has been addressed from different perspectives, such as the scientific and policy perspectives, there is also an ethical and spiritual side to the problem, as it is also an environmental sustainability problem that is closely associated with religious virtues and ethical principles (Abumoghli, 2023). In this regard, environmental sustainability requires not only technical solutions and policies, but also an understanding of moral and spiritual values that foster a sense of human responsibility toward nature as a trust that must be safeguarded.

Spiritual intelligence (SI) is the mental capacity that makes it possible for individuals to become aware of, integrate, and make adaptive use of the non-material, higher aspects of the self. This includes the psychological and existential realms, such as meaning, purpose, moral awareness, self-transcendence, and reflections on relations with others and the world (King, 2008). The proposed notion includes the individual's capacities for existential reflection, meaning, transcendence, and the intentional expansion of states of consciousness. SI, therefore, is an extension of religiosity that refers to the individual's capacity for finding meaning, integrating values, and guiding behavior by reference to deeply held ethical principles (Skrzypińska, 2021). Spirituality, therefore, is seen as an intelligence that is marked by the individual's capacity for generating meaningful, value-consistent reactions to complex life situations, such as life direction, contentment, health, and resilience (Hosaini et al., 2010). Individuals who display higher SI are able to integrate social and moral values into their behavior, such as with the environment (Alshebami et al., 2023). Research suggests that individuals with a spiritually inclined way of viewing the world are more inclined to see nature as morally significant, such as sacred, and that this is linked with environmental concern (Amel et al., 2017).

Connectedness to nature (CN) is the subjective experience of being related to nature and having feelings of identification with nature (Geng et al., 2015). It includes both affective and cognitive feelings of being part of nature. It is not merely the aesthetic experience of nature but also includes the experience of being part of nature (Wu, 2025). Research findings suggest that the level of CN is positively associated with well-being and Pro-environmental behavior (PEB) (Capaldi et al., 2014; Otto & Pensini, 2017; Pritchard et al., 2020). PEB refers to actions that seek to minimize harm to the environment or contribute to environmental protection (Lee et al., 2013). These behaviors include conservation practices, sustainable consumption, and participation in environmental initiatives. PEB is influenced by various psychological factors, including awareness of consequences, perceived behavioral control, and intrinsic motivation (Suárez-Perales et al., 2021). Within this perspective, SI represents a value-integrative cognitive capacity that enables individuals to internalize theological and moral principles in everyday decision-making.

CN, in turn, reflects the affective and identity-based manifestation of such internalized values in relation to the natural world. Examining their simultaneous associations with PEB clarifies how spiritually grounded meaning-making and ecological self-identification coexist within a Muslim cultural context. Although prior research has examined spirituality and pro-environmental behavior (Abdullah & Keshminder, 2020; Gifford & Nilsson, 2014), relatively few studies simultaneously examined SI and CN within a unified empirical framework, particularly in Muslim-majority contexts, nor do they clarify how value-based cognitive capacities and ecological identification operate together in relation to pro-environmental engagement. Much of the existing literature focuses on general religiosity or moral values without explicitly integrating SI as a measurable psychological construct. Moreover, there is a scarcity of empirical investigations that directly examine the relation among these variables among Muslim university students. Considering the theological emphasis on the concept of stewardship, examining the relation among these variables among Muslims would be theoretically meaningful as well as empirically justified.

From the Islamic point of view, the environmental problem is closely associated with the theological principles that emanate from the Quran and the Hadith, as the environmental problem is closely rooted in the principles of *tawhīd*, or the doctrine of the unity of God, as it is closely associated with the interconnectedness of all creation as an expression of God's will. The environmental problem is closely associated with the principles of *khilāfah*, or stewardship, as humans are created as the trustees of the Earth, tasked with the responsibility of maintaining the balance of nature, or *mīzān*, as well as the duty of avoiding corruption, or *fasād* (Bakar et al., 2025; Sya'roni et al., 2025).

Islamic environmental ethics further highlight the importance of moderation (*wasatiyyah*), justice, and accountability in the use of natural resources (Kurbiyanto et al., 2024). The purposes of Islamic law (*maqasid al-shariah*)—particularly the preservation of life and well-being—can also be extended to environmental protection (Rafique & Raza, 2026). Empirical studies have found a positive relation between religiosity in Muslim-majority contexts and environmental concern or pro-environmental behavior (Zafar & Abu-Hussin, 2025). These Islamic principles theoretically suggest that within a Muslim population, spirituality can be related to environmental concern/behavior in a unique cultural context for examining the relation between spirituality and the environment.

This study examines the relation among SI, CN, and PEB among Muslim university students in Indonesia. More specifically, the investigation examines whether there is a statistical relation between SI and PEB, as well as whether there is a statistical relation between connectedness to nature and both SI and PEB within a theoretically informed structural configuration. Additionally, the investigation examines whether there is a statistical mediation effect of connectedness to nature on the relation between SI and PEB within a cross-sectional structural model. This investigation is theoretically meaningful to the field of environmental psychology by integrating the value-based cognitive ability of SI within a theological context of Islam, as well as by examining the simultaneous statistical relation among the variables of SI, CN, and PEB within a single structural model, as well as providing implications for faith-based environmental education programs to promote environmental responsibility among young adults.

Spiritual Intelligence

SI refers to the cognitive ability that helps people incorporate transcendent values, existential meanings, and ethical thinking into their cognitive processes (Amram, 2022; Skrzypińska, 2021). Unlike religiosity, SI includes the cognitive ability to make sense of life occurrences, engage in critical existential thinking, and align behaviors with strong moral principles. According to Zohar and Marshall (2001), SI refers to a cognitive model through which intellectual and emotional thinking operate, enabling people to relate their behaviors to a larger existential and value-based model. Moreover, King and DeCicco (2009) identify the following four dimensions of SI that have been widely used: critical existential thinking, personal meaning production, transcendental awareness, and conscious state expansion. These abilities enable reflective inquiry into purposes and interconnectedness, transcendent awareness, and the alignment of personal values and behavioral choices.

Emerging research findings have linked SI to ethical reasoning, empathy, moral sensitivity, and value-oriented decision-making processes (Amram, 2022; Hong, 2025). This implies that persons who are high in SI may be more disposed to incorporate moral considerations into their daily behaviors. New research findings also show the potential relation that exists between SI and ecological awareness. The capacity to transcend and the meaning that emphasizes interconnectedness may theoretically extend beyond the interpersonal to include the natural world as a whole (Echarri-Iribarren & Echarri-Iribarren, 2021; Mušinović, 2020). Even though there is limited research that has examined the relation that exists between SI and PEB, especially among the Muslim population, the theological focus on moral accountability provides a theoretically relevant foundation to explore such a relation.

Connectedness to Nature

CN is the psychological and affective construct that characterizes an individual's feeling of belonging to the natural world (Mayer & Frantz, 2004). It has been described as the extent to which an individual incorporates nature into their self-concept, such that it includes their emotional affiliations, cognitive identifications, and experiential immersions in ecological systems. It has been considered a relatively stable individual difference variable that reflects the extent to which an individual perceives themselves as connected to the natural world. The scientific literature has consistently demonstrated a positive relation between CN and environmental concern, supporting the construct as a central psychological construct in the investigation of ecological orientation (Mikusiński et al., 2023; Navarro et al., 2017). Research has demonstrated that CN appears to be associated with meaningful experiences in natural environments. Repetitive and emotionally evocative experiences of nature, both in naturalistic situations and in the context of nature-based activities, have been shown to be associated with stronger perceptions of connectedness to nature (Garza-Terán et al., 2022; Richardson et al., 2022). Emotional experiences of awe, tranquility, fascination, etc., have been shown to be particularly relevant to the experience of connectedness to nature, as these emotions have the potential to facilitate a sense of interconnectedness and belonging.

In the context of the escalating global sustainability agenda, CN has emerged as a salient psychological predictor of pro-environmental engagement. Individuals with higher levels of CN have demonstrated a higher level of receptiveness to nature conservation practices,

sustainable consumption patterns, and environmental activism (Mikusiński et al., 2023). These findings have demonstrated that CN has a basis beyond cognitive processes, as the relation between CN and pro-environmental engagement appears to be linked to the affective and experiential dimensions of the individual's connections with nature, which gives rise to the development of an ecological identity. The relation between CN and higher-level value-based capacities, such as SI, has yet to be explored, particularly in the context of religious and culturally-specific groups. The relation between CN and the Muslim population would be of considerable interest as a means of gaining a deeper understanding of the relation between affective ties to nature and the capacity to engage in spiritually informed meaning-making capacities.

Pro-Environmental Behavior

PEB consists of behaviors intentionally directed towards minimizing environmental damage and/or fostering ecological sustainability (Sun et al., 2023; Wan & Du, 2022). PEB can occur in both public and personal spheres. Personal PEB consists of personal behaviors, while public PEB includes civic participation and environmental advocacy. Although these behaviors differ, both types of PEB contribute to the development of sustainability through the accumulation of behavior and normative influences in the community. Theoretically, PEB has been explained by the integrated cognitive, moral, and identity factors of behavior. The Theory of Planned Behavior (TPB) suggests that cognitive factors such as attitudes, subjective norms, and perceived control over behavior are associated with behavior intention and behavior (Ajzen, 1991). Apart from cognitive factors, personal norms based on moral responsibility and environmental self-identity have been strongly linked to environmental engagement. People whose self-identities incorporate environmental responsibility as a moral obligation have a higher probability of displaying PEB consistently, regardless of the context (Udall et al., 2021).

Current literature is increasingly focusing on the importance of the impact of deeper value-based and existential orientations in the facilitation of sustainable behavior. PEB may be understood as value-consistent behavior, which is in line with the beliefs and moral values of an individual. This is in the sense that PEB is not only motivated by extrinsic factors but also involves the internal value system and moral values of the individual in question. In this case, deeper psychological capabilities such as SI, which is the ability to integrate values and create existential meaning, and affective ecological identification, such as the sense of CN, may be linked to PEB in such a manner that the study of these links may help in the understanding of the interplay of the internal value system and the sense of CN in the facilitation of PEB.

Interrelation between SI, CN, and PEB

The antecedents of PEB from spiritual and psychological approaches have received growing research attention to further elucidate the underlying factors promoting such behavior. From the perspective of environmental psychology, two constructs—SI and CN—emerged as complementary approaches to understanding the relation between the two. Specifically, SI pertains to the value-based and existential meaning-making and ethical integration process, while CN pertains to the affective and identity-based nature of affiliation. Examining the concurrent relation between the two constructs could provide further insights into the co-occurring association between moral frameworks and nature affiliation in the context of PEB.

CN has consistently shown concurrent relation with environmental concern and PEB across different cultural groups (Geng et al., 2015; Guazzini et al., 2025). Individuals with higher CN tend to support and practice nature conservation and activism. Previous research has also established CN as an intervening variable in the context of psychological approaches to understanding PEB. Specifically, the study found that CN could potentially serve as the psychological bridge between values and experiences and PEB through the formation of ecological identification (Diessner et al., 2018; Rosa et al., 2018). Collectively, these findings situate CN as a psychological bridge linking values and experiences with environmental engagement.

While CN is essentially linked to affective ecological identification, the concept of SI adds an existential and ethical dimension to this. As part of the broader interdisciplinary discourse on ecology, theology, and the sociology of religion, the term "ecospirituality" has already been used to refer to the integration of ecological and spiritual meaning-making. Instead of referring to a specific and unified theory, the term "ecospirituality" seems to refer to the broad range of perspectives in which ecological concerns are embedded in spiritual and transcendental worldviews. As part of the organizational context, ecospirituality has been referred to by Onubi (2024) in the context of the integration of spiritual and ecological concerns, particularly with regard to voluntary approaches to environmental responsibility. SI includes the ability to make meaning, to recognize interconnectedness, and to exercise moral values in decision-making. Empirical studies have shown that individuals with a spiritually oriented value orientation tend to have higher levels of intrinsic motivation and value-based commitment to ecological responsibility (Afsar et al., 2016). This application does not create a new construct but rather illustrates the manner in which spirituality-based value systems may correspond to ecological commitments in specific contexts.

Current study

Current empirical results also indicate that spirituality-related constructs relate to CN and PEB (Rezapouraghdam et al., 2018). Breaking from the deterministic model, the present study employs a theoretically derived mediation model in which CN is statistically controlled as a mediator in the relation between SI and PEB. Here, SI is conceptualized as a value-based cognitive ability, CN as an affective ecological identification, and PEB as a behavioral expression. Expanding from this synthesis, a partial mediation model is offered, as in Figure 1 [below](#).

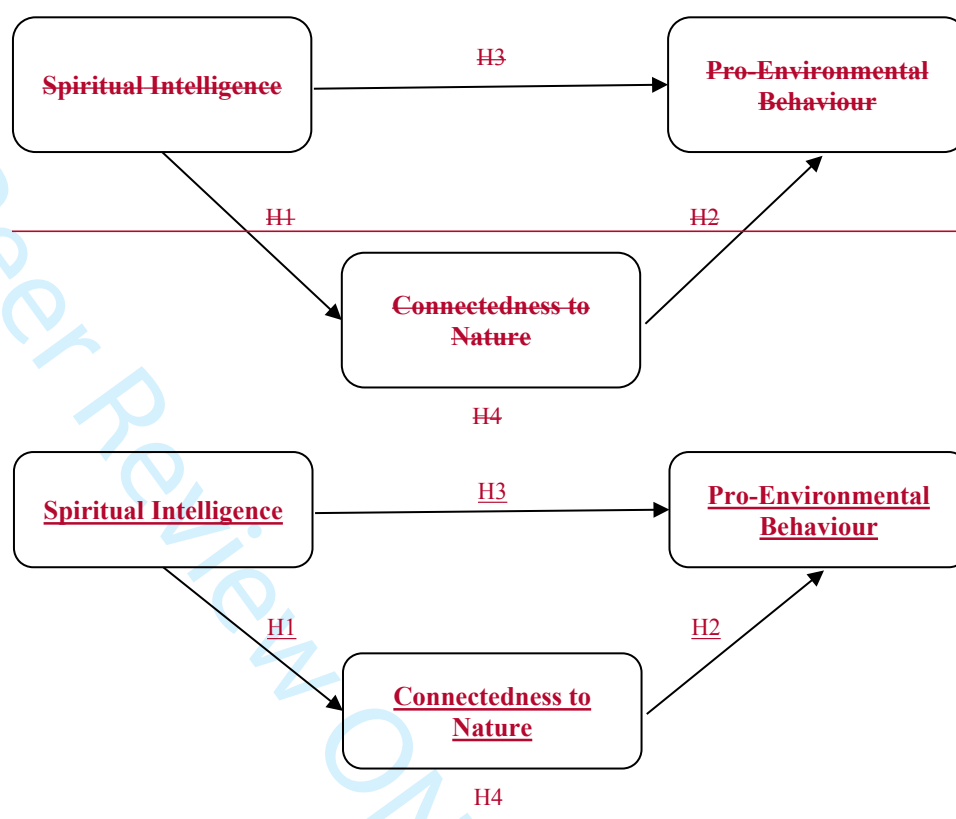


Figure 1. Conceptual model underlying the study

As depicted in Figure 1, the model specifies both direct and indirect pathways. A direct path from SI to PEB is proposed, alongside an indirect path through CN, reflecting a partial mediation structure. Accordingly, the hypotheses guiding this study are as follows:

H1: SI is positively associated with CN.

H2: CN is positively associated with PEB.

H3: SI is positively associated with PEB.

H4: CN statistically mediates the association between SI and PEB

Method

Research Design

This study employed a quantitative cross-sectional survey design to examine the relation among SI, CN, and PEB. Structural Equation Modeling (SEM) was used to estimate the hypothesized structural association among the latent constructs (Hair et al., 2021). Prior to structural modeling, Rasch analysis was conducted to improve the measurement properties of the Likert-type data (Bond & Fox, 2015).

Participants and Sampling

Data were collected through an online questionnaire. Participation was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were ensured, and the study adhered to established research ethics standards. The study used non-probability convenience sampling based on the inclusion criterion of being an actively enrolled

undergraduate student at an Indonesian university. A total of 251 students participated. The sample consisted of 69.38% female ($n = 179$) and 30.62% male ($n = 79$). As regards the year of study, 22.48% were first-year students, 6.58% second-year, 33.72% third-year, and 37.20% fourth-year students who completed their final projects. Despite convenience sampling's generalizability limits, it allows exploration of association patterns within the defined society (Creswell & Creswell, 2018).

Instruments

All constructs were measured using previously validated Likert-type scales. SI was measured using the Spiritual Intelligence Self-Report Inventory (SISRI-24) formulated by King and DeCicco (2009). The instrument includes four dimensions: critical existential thinking, personal meaning making, transcendental awareness, and conscious state expansion. However, after conducting the Rasch misfit analysis, the scale was reduced to 23 items. CN was measured using the Connectedness to Nature Scale developed by Mayer and Frantz (2004), consisting of 14 items assessing individuals' emotional and experiential connection with the natural environment. PEB was measured using the Pro-Environmental Behavior Scale developed by Mateer et al. (2022), capturing behaviors in private and public sustainability domains. All instruments were conducted using Likert-type response formats through Google Forms.

Data Analysis

The data analysis was done in various stages. First, descriptive statistics were calculated, followed by the application of the Rasch analysis, which converts ordinal Likert scales into interval data based on the principles of item response theory. The Rasch model is useful for the concurrent estimation of person measures and item difficulties, thus providing more precise measurements (Yan & Cheng, 2015). The psychometric analysis includes person reliability, item reliability, infit, outfit, explained variance, and category-functioning statistics. Third, Pearson correlation analysis was performed to examine preliminary bivariate associations among SI, CN, and PEB. Finally, Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS software. PLS-SEM was selected due to its suitability for complex models and moderate sample sizes (Hair et al., 2021).

The measurement (outer) model was evaluated by examining outer loadings, composite reliability (CR), average variance extracted (AVE), and the Heterotrait–Monotrait (HTMT) ratio to assess convergent and discriminant validity. The structural (inner) model was assessed by analyzing path coefficients, their statistical significance using bootstrapping with 5,000 resamples, and R^2 values to evaluate explanatory power (Hair et al., 2021). For mediation analysis, the indirect effect of SI on PEB through CN was tested using bias-corrected bootstrapping procedures. Mediation was supported when the 95% confidence interval of the indirect effect did not include zero (Hayes, 2022).

Results

Psychometric Properties of the measurement scales

Rasch analysis was conducted to evaluate psychometric properties on the SI, CN, and PEB instruments. Table 1 below explains the result of the analysis, ensuring the robustness of

measurement scales in order to ensure data reliability and validity are employed while testing the proposed model.

Table 1: Psychometric Properties of Measurement Scale

Scale	No. of Items	Rasch person/item Reliability	Rasch person/item separation indices	Variance Explained by Measures	Andrich Threshold			
					1	2	3	4
SI	23	0.91/0.97	3.18/5.38	42.7%	-2.16	-1.26	0.82	2.60
CNS	14	0.75/0.99	1.75/8.47	45.1%	-1.56	-0.87	0.54	1.88
PEB	14	0.77/0.98	1.85/7.55	45.1%	-2.75	-0.90	0.73	2.92

As reported in Table 1, the Rasch person and item reliability coefficients indicated acceptable internal consistency and stable item calibration across all three instruments. Furthermore, the separation indices corroborated that the items separated well along the latent continuum, with the variance explained by measure demonstrating a high ratio of response variance attributed to the constructs. Category threshold estimates showed an ordered progression for all response categories, suggesting appropriate functioning of the five-point Likert scale.

Descriptive statistics

Descriptive statistics based on Rasch person measures were calculated to examine the distribution of SI, CN, and PEB as presented in Table 2. The determination of respondent levels was conducted based on the person-measure distribution using the mean and standard deviation approach. Respondents are categorized as low category if they have a score below the mean – 1 SD, moderate category if they are in the range of the mean \pm 1 SD, and high category if they have a score above the mean + 1 SD. This approach allows grouping individuals based on their relative position on the latent construct continuum.

Table 2: Distribution of Respondents' Levels based on Rasch Person Measure

Variable	Mean	SD	Low n (%)	Moderate n (%)	High n (%)
Spiritual Intelligence	1.30	0.28	113 (45%)	37 (15%)	101 (40%)
Connectedness to Nature	0.77	0.58	45 (18%)	148 (59%)	58 (23%)
Pro-Environmental Behavior	0.11	0.70	40 (16%)	169 (67%)	42 (17%)

N = 251. Note: Rasch-transformed logit scores used. ** $p < .01$

As presented in Table 2, the distribution reveals variation across the three constructs. The distribution of SI is relatively dispersed across categories with respondents predominantly grouped into the low and high category. On the other hand, the majority of respondents fell into the moderate category for both CN and PEB.

Correlation between Variables

The correlation analysis was conducted to examine the bivariate relation between SI, CN, and PEB. Correlations were calculated based on latent construct scores estimated using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. The correlation

matrix between variables is presented in Table 3.

Table 3: Correlation Matrix Between Research Variables

Variable	r_1	r_2	r_3
Spiritual Intelligence	-		
Connectedness to Nature	0.576**	-	
Pro-Environmental Behavior	0.412**	0.425	-

N = 251. Note: ** $p < 0.01$

Table 3 summarizes that regarding the intercorrelations among the constructs. The results indicate strong, positive, and statistically significant associations among SI, CN, and PEB, providing preliminary empirical support for the proposed structural model and therefore must be further investigated using PLS-SEM analysis.

Structural Model Evaluation and Hypotheses Testing

This section presents the results of the structural model analysis examining the hypothesized associations among SI, CN, and PEB. Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS. Statistical significance was assessed through bootstrapping with 5,000 resamples. The structural model and path coefficients are presented in Figure 2.

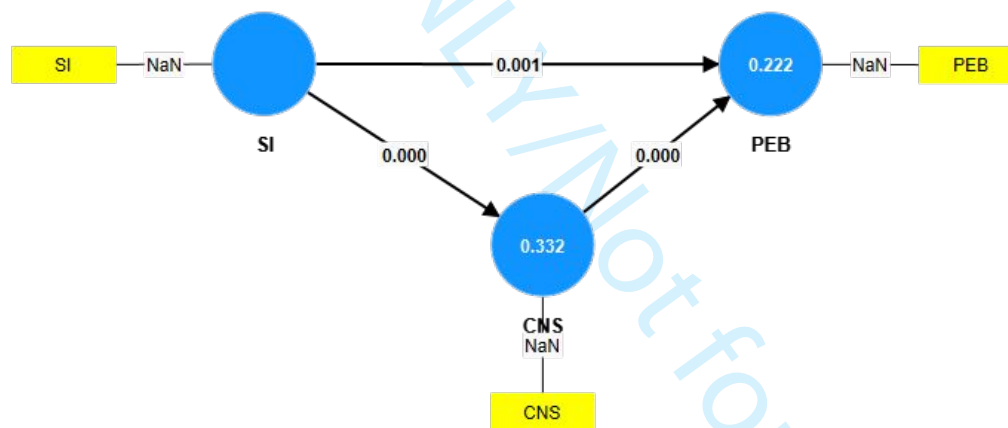


Figure 2. Structural Model of the Interrelation between SI, CN, and PEB

The structural model evaluated in Figure 2 demonstrates that SI and CNS account for a meaningful proportion of the variance in PEB. Furthermore, as presented in Table 4, the path analysis reveals that SI has a positive and significant direct relationship with both CNS and PEB. CNS also demonstrates a positive and significant relationship with PEB. Consequently, Hypotheses 1, 2, and 3 are fully supported.

Table 4: Structural Model Path Coefficients

Path	Original Sample (O)	Sample Mean (M)	STDEV	T-value	P-value	Decision
CNS → PEB	0.280	0.280	0.062	4.526	<0.001	Supported
SI → CN	0.576	0.579	0.041	13.960	<0.001	Supported
SI → PEB	0.251	0.252	0.073	3.418	<0.001	Supported

The results indicate that SI is positively and significantly related to CN, providing support for hypothesis 1. CN is also positively associated with PEB, thereby supporting hypothesis 2. In addition, SI demonstrates a significant direct relation with PEB, confirming hypothesis 3. Following these findings, an indirect-effect analysis was conducted to examine the mediating role of connectedness to nature in the relation between SI and PEB. The detailed results of the indirect effect are presented in Table 5.

Table 5: Specific Indirect Relation on the Mediation of CN in SI and PEB Interrelation

Path	Original Sample (O)	Sample Mean (M)	STDEV	T-value	P-value	Decision
SI → CN → PEB	0.161	0.162	0.038	4.267	<0.001	Supported

As detailed in Table 5, the analysis demonstrates a statistically significant indirect association. This finding supports Hypothesis 4, indicating that CN partially mediates the relationship between SI and PEB. Although the structural model specifies theoretically directional paths, the cross-sectional design does not allow conclusions regarding temporal precedence or causality. The reported coefficients therefore reflect statistically significant associations within the proposed model structure.

Discussion

The psychometric analysis shows that the tools used to measure the levels of SI, CN, and PEB have high quality in the current sample population. The high reliability coefficient and smooth response patterns indicate that the participants understood the tools well, providing a good basis to examine the relation observed (Bond & Fox, 2015). The analysis shows that there was a positive inter-correlation association between SI, CN, and PEB. In summary, students with higher levels of SI reported a stronger sense of belonging to nature as well as a higher frequency of PEB. It is worth noting that CN acts as a mediator in the relation between spiritual values and environmental behavior. Although the findings have statistical significance, it is worth noting that the relation observed is only associative in nature.

The positive link between SI and CN is consistent with Islamic principles of environmental ethics. *Tawhid* (the unity of God), *Khalifah* (stewardship), and *Mizan* (balance) are principles that offer a framework through which nature is perceived as a divine order (Mangunjaya & McKay, 2012). For Indonesian students, SI may mean a theological imagination of nature as a sacred relational other. This understanding of SI resonates with Muralidharan et al.'s study (2024), which suggests that spiritual beliefs give rise to an ecologically conscious psychology. In such a worldview, SI rekindles a pre-existing spiritual connection through which caring for the environment becomes a way of affirming God's existence through His signs (*Ayatullah*).

The findings also confirm that CN is a significant correlate of PEB, echoing a substantial body of research (Guazzini et al., 2025; Mayer & Frantz, 2004). CN involves an ontological change in which the individual incorporates nature into their self-schema. This interpretation is supported in the Indonesian context through the notion of *mizan*, whereby the maintenance of ecological equilibrium is perceived as the will of God and therefore is an

integral part of one's moral responsibility. This emotional and relational dimension is important because, as Pasca (2022) has argued, emotions such as feelings of pride and guilt often mediate the interrelation between CN and behavior. Furthermore, the results suggest that CN is an important determinant of moral identity. As Keith et al. (2022) have noted, CN is related to an environmental self-identity, which in turn drives individuals to behave in accordance with their pro-environmental values. While the present study does not assess childhood experiences, the strength of the CN-PEB relation is in line with the literature suggesting that early exposure to nature is likely to shape ecological behavior in adulthood (Rosa et al., 2018).

The results thus validate the assumption of the importance of CN as a predictor of PEB, as reinforced in the literature on the topic (Zohar & Marshall, 2001; Amram, 2022). In the case of Muslim youth, environmentalism is commonly an expression of ecological piety in which PEB is considered an essential component of *maqashid al-shari'ah* (the higher objectives of Islamic law). This thus validates the assumption of the role of spirituality in the promotion of sustainable behaviors through the promotion of spiritual well-being in individuals (Fisher & Ng, 2017). The Indonesian context, for instance, is noteworthy for the promotion of such internal aspects of spirituality through initiatives such as the Eco-Pesantren program (Mangunjaya & McKay, 2012). In such contexts, environmentalism is no longer just about compliance with top-down regulatory frameworks but is an essential component of one's spirituality. This is not surprising, as Luetz and Nunn (2023) noted the stronger influence of spirituality on sustainable behaviors in cultures in which spirituality informs the broader discourse on morality.

Throughout all of these studies, however, there exists a multi-layered framework wherein SI informs worldview and meaning-making structures, CN translates these worldview structures into experiential realities, and PEB emerges as its behavioral correlate. Rather than considering SI and CN as distinct predictors of PEB, they are seen as a synergistic complex of values and emotional states (Merlo et al., 2025). This suggests that interventions designed to promote sustainability must move beyond external factors such as policy and reward systems and focus on inner development as a critical factor (Barbaro & Pickett, 2016). For example, mindfulness-based interventions or religious education that places a strong emphasis on active attention to nature may be more effective in producing long-term behavioral habits than purely informational-based ones. interventions (Richardson et al., 2022). These findings have significant implications for understanding the complex cognitive and emotional processes that underlie environmentally sustainable behavioral responses.

Implication of the Study

This current study also contributes to the fields of environmental psychology and sustainability research, particularly through the exploration of the combined association between SI and CN and their relation to PEB in a university setting where the student population was predominantly Muslim. The results of this current study add to the existing body of knowledge on the topic of PEB through the exploration of the potential role of the ethical and meaningful aspects of environmental behaviors. The significant relation between SI and PEB suggests that the integration of values based on spirituality may play a role in environmental decision-making, which aligns with the majority of the existing research on the topic but was conducted from an organizational rather than a university setting. The significant

association between CN and PEB was consistent with the majority of the environmental psychology literature that also found this relation to be significant. The current study found that the relation between SI and PEB was mediated by CN, which suggests that the cognitive-moral and affective ecological identification aspects of environmental behaviors may be present together but does not suggest that one comes before the other. From a practical perspective, the current study suggests that there may be potential benefits to the inclusion of values-based approaches to environmental behaviors, as well as experiential approaches to nature, in the design of environmental programs in a university setting.

Limitation of Study

Despite the study's contributions, the present study has several limitations. First, the study is cross-sectional in nature and does not allow causal inference. While the partial least squares structural equation modeling (PLS-SEM) model is theoretically derived to have causal paths, the study does not allow the assessment of causality in the model, and reverse models are also possible. Second, the study relied on self-report measures to assess the construct, which may have limitations in the form of common method variance and social desirability bias. Third, the study relied on convenience sampling from Indonesian students and may not generalize to the larger population. Fourth, although the model has been supported and has predictive validity in the form of variance in connectedness to nature and pro-environmental behavior, several other factors may have been included to further understand the phenomenon, such as environmental knowledge, perceived behavioral control, and institutional factors.

Conclusion

This study aimed to examine the relation between SI, CN, and PEB among Indonesian university students using the PLS-SEM approach, guided by the proposed theoretical model. The reliability and validity of the instruments were established using the Rasch analysis, indicating that the transformed scores exhibited good reliability and validity. The proposed theoretical model was supported by the finding that SI was positively related to PEB, while connectedness to nature was also positively related to pro-environmental behavior. Further, the mediation analysis revealed that CN partially mediated the relation between SI and PEB. The present study suggests that cognitive-moral abilities and affective ecological identification may coexist as part of the broader sustainability orientation. Although the present study has some limitations, the results of the present study may contribute to the discourse on environmental psychology by highlighting the potential importance of spiritually informed meaning-making and nature identification for sustainability-oriented approaches. Further research is needed to clarify the interrelation between the constructs of the present study.

References

- Abdullah, M. S., & Keshminder, J. S. (2020). Religion and pro-environmental behaviour: A comparative analysis towards environmental protection. *International Journal of Environment and Sustainable Development*, 19(2), 174. <https://doi.org/10.1504/IJESD.2020.106662>
- Abumoghli, I. (2023). The role of religions, values, ethics, and spiritual responsibility in environmental governance and achieving the sustainable development agenda. *Religion and Development*, 2(3), 485–495. <https://doi.org/10.30965/27507955-20230008>
- Afsar, B., Badir, Y., & Kiani, U. S. (2016). Linking spiritual leadership and employee pro-environmental behavior: The influence of workplace spirituality, intrinsic motivation, and environmental passion. *Journal of Environmental Psychology*, 45, 79–88. <https://doi.org/10.1016/j.jenvp.2015.11.011>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Alshebami, A. S., Alholiby, M. S., Elshaer, I. A., Sobaih, A. E. E., & Al Marri, S. H. (2023). Examining the relationship between green mindfulness, spiritual intelligence, and environmental self identity: Unveiling the path to green entrepreneurial intention. *Administrative Sciences*, 13(10), 226. <https://doi.org/10.3390/admsci13100226>
- Amel, E., Manning, C., Scott, B., & Koger, S. (2017). Beyond the roots of human inaction: Fostering collective effort toward ecosystem conservation. *Science*, 356(6335), 275–279. <https://doi.org/10.1126/science.aal1931>
- Amram, Y. J. (2022). The intelligence of spiritual intelligence: Making the case. *Religions*, 13(12), 1140. <https://doi.org/10.3390/rel13121140>
- Bakar, S. A., Hussin, H., Rozani, M. A. S., & Ahmad, Z. A. S. (2025). Environmental ethics in the Qur'an: A thematic analysis of conservation and stewardship. *Global Journal Al-Thaqafah*, 31–45. <https://doi.org/10.7187/GJATSI122025-3>
- Barbaro, N., & Pickett, S. M. (2016). Mindfully green: Examining the effect of connectedness to nature on the relationship between mindfulness and engagement in pro-environmental behavior. *Personality and Individual Differences*, 93, 137–142. <https://doi.org/10.1016/j.paid.2015.05.026>
- Bond, T., & Fox, C. M. (2015). *Applying the Rasch Model: Fundamental measurement in the human science, Thrid edition (3rd ed.)*. Routledge. <https://doi.org/10.4324/9781315814698>
- Capaldi, C. A., Dopko, R. L., & Zelenski, J. M. (2014). The relationship between nature connectedness and happiness: A meta-analysis. *Frontiers in Psychology*, 5. <https://doi.org/10.3389/fpsyg.2014.00976>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (Fifth edition). SAGE.
- Diessner, R., Genthôs, R., Praest, K., & Pohling, R. (2018). Identifying with nature mediates the influence of valuing nature's beauty on proenvironmental behaviors. *Ecopsychology*, 10(2), 97–105. <https://doi.org/10.1089/eco.2017.0040>
- Echarri-Iribarren, F., & Echarri-Iribarren, V. (2021). Environmental education and ecological spiritual intelligence: The case of Basque mythology. *Australian Journal of Environmental Education*, 37(2), 120–131. <https://doi.org/10.1017/ae.2020.33>

- Fisher, J., & Ng, D. (2017). Presenting a 4-Item Spiritual Well-Being Index (4-ISWBI). *Religions*, 8(9), 179. <https://doi.org/10.3390/rel8090179>
- Garza-Terán, G., Tapia-Fonllem, C., Fraijo-Sing, B., Borbón-Mendivil, D., & Poggio, L. (2022). Impact of contact with nature on the wellbeing and nature connectedness indicators after a desertic outdoor experience on Isla Del Tiburon. *Frontiers in Psychology*, 13, 864836. <https://doi.org/10.3389/fpsyg.2022.864836>
- Geng, L., Xu, J., Ye, L., Zhou, W., & Zhou, K. (2015). Connections with nature and environmental behaviors. *PLOS ONE*, 10(5), e0127247. <https://doi.org/10.1371/journal.pone.0127247>
- Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology*, n/a-n/a. <https://doi.org/10.1002/ijop.12034>
- Guazzini, A., Valdrighi, G., Fiorenza, M., & Duradoni, M. (2025). The relationship between connectedness to nature and Pro-environmental behaviors: A systematic review. *Sustainability*, 17(8), 3686. <https://doi.org/10.3390/su17083686>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-80519-7>
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (Third edition). The Guilford Press.
- Hong, T. K. (2025). *The imperative of business ethics and the role of spiritual intelligence in enhancing ethical thinking in the workplace*. Unpublished. <https://doi.org/10.13140/RG.2.2.30732.63363>
- Hosaini, M., Elias, H., Krauss, S. E., & Aishah, S. (2010). A review study on spiritual intelligence, adolescence and spiritual intelligence, factors that may contribute to individual differences in spiritual intelligence, and the related theories. *International Journal of Psychological Studies*, 2(2), p179. <https://doi.org/10.5539/ijps.v2n2p179>
- Ibáñez-Rueda, N., Guillén-Royo, M., & Guardiola, J. (2020). Pro-environmental behavior, connectedness to nature, and wellbeing dimensions among Granada students. *Sustainability*, 12(21), 9171. <https://doi.org/10.3390/su12219171>
- Keith, R. J., Given, L. M., Martin, J. M., & Hochuli, D. F. (2022). Environmental self-identity partially mediates the effects of exposure and connection to nature on urban children's conservation behaviours. *Current Research in Ecological and Social Psychology*, 3, 100066. <https://doi.org/10.1016/j.cresp.2022.100066>
- King, D. B. (2008). *Rethinking claims of spiritual intelligence: A definition, model, and measure* [Master Degree program, Trent University]. <https://api.semanticscholar.org/CorpusID:146499861>
- King, D. B., & DeCicco, T. L. (2009). A viable model and self-report measure of spiritual intelligence. *International Journal of Transpersonal Studies*, 28(1), 68–85. <https://doi.org/10.24972/ijts.2009.28.1.68>
- Kurbiyanto, A., Yusmaliana, D., Fitriana, F., Altiarika, E., & Sabri, F. (2024). Environmental ethics in Islamic teachings: Discussing ethical principles in Islamic teachings that emphasize environmental protection and preservation. In A. Sharifi, J. L. Candelaria, D. Simangan, & S. Kaneko (Eds.), *Navigating Peace and Sustainability in an*

- Increasingly Complex World* (pp. 15–34). Springer Nature Singapore. https://doi.org/10.1007/978-981-97-8772-2_2
- Lee, T. H., Jan, F.-H., & Yang, C.-C. (2013). Conceptualizing and measuring environmentally responsible behaviors from the perspective of community-based tourists. *Tourism Management*, *36*, 454–468. <https://doi.org/10.1016/j.tourman.2012.09.012>
- Luetz, J. M., & Nunn, P. D. (2023). Spirituality and sustainable development: An entangled and neglected relationship. *Sustainability Science*, *18*(4), 2035–2042. <https://doi.org/10.1007/s11625-023-01347-8>
- Mangunjaya, F. M., & McKay, J. E. (2012). Reviving an Islamic Approach for Environmental Conservation in Indonesia. *Worldviews*, *16*(3), 286–305. <https://doi.org/10.1163/15685357-01603006>
- Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, *24*(4), 503–515. <https://doi.org/10.1016/j.jenvp.2004.10.001>
- Merlo, G., Pereira-Sanchez, V., Lee, W., Wong, William T., & Morales, M. J. (2025). Connectedness as a mental health pillar: To self, others, and the world. *Psychiatric Annals*, *55*(7). <https://doi.org/10.3928/00485713-20250613-03>
- Mikusiniński, G., Elbakidze, M., Orlikowska, E. H., Skaltsa, I. G., Żmihorski, M., & Iwińska, K. (2023). Elucidating human–nature connectedness in three EU countries: A pro-environmental behaviour perspective. *People and Nature*, *5*(5), 1577–1591. <https://doi.org/10.1002/pan3.10523>
- Muralidharan, S., La Ferle, C., & Roth-Cohen, O. (2024). How religiosity and spirituality influences the ecologically conscious consumer psychology of Christians, the non-religious, and atheists in the United States. *Archive for the Psychology of Religion*, *46*(1), 71–87. <https://doi.org/10.1177/00846724231225674>
- Mušinović, F. (2020). Spiritual intelligence and business environments. *Academica Turistica*, *13*(2), 167–177. <https://doi.org/10.26493/2335-4194.13.167-177>
- Navarro, O., Olivos, P., & Fleury-Bahi, G. (2017). “Connectedness to nature scale”: Validity and reliability in the French context. *Frontiers in Psychology*, *8*, 2180. <https://doi.org/10.3389/fpsyg.2017.02180>
- Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*, 88–94. <https://doi.org/10.1016/j.gloenvcha.2017.09.009>
- Pasca, L. (2022). Pride and guilt as mediators in the relationship between connection to nature and pro-environmental intention. *Climatic Change*, *175*(1–2), 5. <https://doi.org/10.1007/s10584-022-03458-0>
- Pritchard, A., Richardson, M., Sheffield, D., & McEwan, K. (2020). The relationship between nature connectedness and eudaimonic well-being: A meta-analysis. *Journal of Happiness Studies*, *21*(3), 1145–1167. <https://doi.org/10.1007/s10902-019-00118-6>
- Rafique, M. O., & Raza, K. M. (2026). Islamic green finance. In E. Smolo & M. O. Rafique (Eds.), *Islamic green finance: A marriage of ethics and environmental responsibility in light of Maqasid al-Shari'ah*. Routledge. <https://doi.org/10.4324/9781003540403>

- Rezapouraghdam, H., Alipour, H., & Darvishmotevali, M. (2018). Employee workplace spirituality and pro-environmental behavior in the hotel industry. *Journal of Sustainable Tourism*, 26(5), 740–758. <https://doi.org/10.1080/09669582.2017.1409229>
- Richardson, M., Hamlin, I., Butler, C. W., Thomas, R., & Hunt, A. (2022). Actively noticing nature (not just time in nature) helps promote nature connectedness. *Ecopsychology*, 14(1), 8–16. <https://doi.org/10.1089/eco.2021.0023>
- Rosa, C. D., Profice, C. C., & Collado, S. (2018). Nature experiences and adults' self-reported pro-environmental behaviors: The role of connectedness to nature and childhood nature experiences. *Frontiers in Psychology*, 9, 1055. <https://doi.org/10.3389/fpsyg.2018.01055>
- Skrzypińska, K. (2021). Does spiritual intelligence (SI) exist? A theoretical investigation of a tool useful for finding the meaning of life. *Journal of Religion and Health*, 60(1), 500–516. <https://doi.org/10.1007/s10943-020-01005-8>
- Suárez-Perales, I., Valero-Gil, J., Leyva-de La Hiz, D. I., Rivera-Torres, P., & Garcés-Ayerbe, C. (2021). Educating for the future: How higher education in environmental management affects pro-environmental behaviour. *Journal of Cleaner Production*, 321, 128972. <https://doi.org/10.1016/j.jclepro.2021.128972>
- Sun, J., Ma, B., & Wei, S. (2023). Same gratitude, different pro-environmental behaviors? Effect of the dual-path influence mechanism of gratitude on pro-environmental behavior. *Journal of Cleaner Production*, 415, 137779. <https://doi.org/10.1016/j.jclepro.2023.137779>
- Sya'roni, Mokh., Nor Ichwan, Moh., Pratama, M. Y., & Ming, D. (2025). Ecotheological insights from prophetic hadiths: Reframing Islamic environmental ethics based on SDGs. *Pharos Journal of Theology*, (106.5). <https://doi.org/10.46222/pharosjot.106.51>
- Udall, A. M., De Groot, J. I. M., De Jong, S. B., & Shankar, A. (2021). How I see me—A meta-analysis investigating the association between identities and pro-environmental behaviour. *Frontiers in Psychology*, 12, 582421. <https://doi.org/10.3389/fpsyg.2021.582421>
- Wan, Q., & Du, W. (2022). Social capital, environmental knowledge, and pro-environmental behavior. *International Journal of Environmental Research and Public Health*, 19(3), 1443. <https://doi.org/10.3390/ijerph19031443>
- Wu, J. (2025). Green mind, healthy mind: Investigating nature's role in students' health-related quality of life in China. *BMC Psychology*, 13(1), 334. <https://doi.org/10.1186/s40359-025-02609-z>
- Wynes, S., & Nicholas, K. A. (2017). The climate mitigation gap: Education and government recommendations miss the most effective individual actions. *Environmental Research Letters*, 12(7), 074024. <https://doi.org/10.1088/1748-9326/aa7541>
- Yan, Z., & Cheng, E. C. K. (2015). Primary teachers' attitudes, intentions and practices regarding formative assessment. *Teaching and Teacher Education*, 45, 128–136. <https://doi.org/10.1016/j.tate.2014.10.002>
- Zafar, M. B., & Abu-Hussin, M. F. (2025). Faith, growth, and ethics: Cross-cultural analysis of religiosity and environment protection vis-a-vis economic priorities among Muslims. *Journal of Environmental Psychology*, 106, 102716. <https://doi.org/10.1016/j.jenvp.2025.102716>

Zohar, D., & Marshall, I. (2001). *Spiritual intelligence: The ultimate intelligence*. Bloomsbury Publishing Plc.

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