

FROM RECOVERY TO SUSTAINABILITY: THE ROLE OF PSYCHOLOGICAL OWNERSHIP AND SATISFACTION IN PROMOTING ENVIRONMENTALLY RESPONSIBLE BEHAVIOR IN NATURE-BASED TOURISM

Nhu Nguyen Thi Quynh

Ho Chi Minh City University of Industry and Trade

Email: nhuntquynh@huit.edu.vn

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ABSTRACT

This study explores how perceived restorativeness in nature-based tourism destinations translates into travellers' environmentally responsible behavior (ERB). Based on the Reasonable Person Model and the Stimulus-Organism-Response theoretical framework, the study proposes and validates a theoretical model that explains the underlying psychological mechanisms that drive sustainable behavior. Data were collected from 349 Ho Chi Minh City travelers, who had visited coastal, island, and forest destinations in Vietnam. The data were analyzed using the PLS-SEM methodology. The results show that perceived restorativeness (PR) not only directly impacts ERB but also indirectly through two intermediate mechanisms: psychological ownership and satisfaction. Specifically, perceived restorativeness increases the sense of destination belonging and reinforces a positive appreciation of the experience, which in turn promotes the behavior in a way that is environmentally friendly. This finding suggests that the recovery experience not only provides health and emotional benefits but also serves as a strategic psychological resource that promotes sustainability at the destination. By integrating the theory of the restorative environment with the study of psychological ownership and sustainable behaviors, this study clarifies the path of transformation from restoration to responsibility. The results contribute to the theory of green and sustainable tourism and provide important governance implications for designing destination environments that nurture long-term, responsible traveller behavior.

Keywords: Perceived restorativeness, psychological ownership, satisfaction, environmentally responsible behavior, nature-based tourism.

1. INTRODUCTION

The rapid expansion of the global tourism industry has undeniably contributed to economic growth; however, it has simultaneously intensified environmental degradation and resource depletion [1]. In response, promoting tourists' environmentally responsible behavior (ERB) has become a critical priority for sustainable destination management [2]. Despite increasing awareness of environmental sustainability, a persistent "attitude-behavior gap" remains evident, whereby tourists' pro-environmental attitudes often fail to translate into actual responsible actions [3]. In many cases, tourists prioritize hedonic enjoyment and relaxation over environmental concerns, resulting in limited adoption of sustainable practices during travel [4]. This discrepancy highlights the urgent need to better understand the underlying mechanisms that can effectively bridge the gap between environmental awareness and behavior.

From a theoretical perspective, understanding tourist behavior requires a deeper exploration of internal psychological processes [5]. The Stimulus–Organism–Response (S-O-R) framework suggests that external environmental stimuli influence individuals' cognitive and emotional states, which subsequently shape their behavioral responses [4, 5]. Within tourism contexts, psychological constructs such as emotional attachment, perceived value, and satisfaction have been identified as key mediators in translating experiences into behavioral outcomes [6]. These psychological mechanisms are particularly important in mitigating the attitude–behavior gap and encouraging pro-environmental engagement.

In this regard, Attention Restoration Theory (ART) provides a valuable lens for understanding how tourism environments influence psychological states. Prior studies have demonstrated that perceived restorativeness can reduce mental fatigue, enhance emotional well-being, and improve overall tourist experiences [2, 7, 8]. At the same time, Psychological Ownership Theory suggests that when individuals develop a sense of possession and emotional connection toward a place, they are more likely to engage in protective and responsible behaviors [9]. However, despite these theoretical advancements, existing research remains fragmented. Specifically, there is a lack of integrative frameworks that link restorative environmental experiences with pro-environmental behavior through underlying psychological mechanisms [10].

To address this gap, the present study proposes an integrated S-O-R-based model in which perceived restorativeness acts as a stimulus, psychological ownership and satisfaction function as organismic states, and environmentally responsible behavior represents the response. Accordingly, this study aims to (1) examine the direct effects of perceived restorativeness on psychological ownership and satisfaction, and (2) investigate the mediating roles of psychological ownership and satisfaction in translating perceived restorativeness into environmentally responsible behavior.

This study makes several important contributions to sustainable tourism literature. First, it extends the S-O-R framework by integrating Attention Restoration Theory with Psychological Ownership Theory, thereby offering a more comprehensive psychological explanation of environmentally responsible behavior. Second, methodologically, the study applies Partial Least Squares Structural Equation Modeling (PLS-SEM) to test complex mediation relationships, providing robust predictive insights [11]. Finally, from a practical perspective, the findings offer actionable implications for destination management organizations by emphasizing the importance of designing restorative environments that foster both tourist satisfaction and long-term environmentally responsible behavior.

2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1. Theoretical Foundation

2.1.1. Stimulus–Organism–Response (S-O-R)

The Stimulus–Organism–Response (S-O-R) framework, originally proposed by Mehrabian and Russell [12], offers a well-established theoretical foundation for explaining human behavior in environmental contexts. The model suggests that external environmental stimuli (S) influence individuals' internal cognitive and affective states (O), which subsequently lead to behavioral responses (R).

Within tourism settings, destination attributes, particularly restorative environmental characteristics, serve as critical stimuli that shape tourists' internal psychological evaluations, such as satisfaction and psychological ownership. These organismic states, in turn, drive approach-oriented outcomes, including environmentally responsible behavior (ERB).

Accordingly, the S-O-R paradigm provides a coherent lens to examine how tourism experiences translate into sustainable behavioral responses.

2.1.2. Attention Restoration Theory (ART)

Attention Restoration Theory (ART), developed by Kaplan and Kaplan [13], explains how specific environments support recovery from mental fatigue and cognitive overload. The theory identifies four key dimensions of restorative environments: being away (psychological or physical escape from routine), extent (a coherent and rich environment), fascination (effortless attention engagement), and compatibility (alignment with individual preferences).

Tourism destinations often embody these restorative characteristics, enabling visitors to regain psychological resources, reduce stress, and enhance overall well-being. As such, perceived restorativeness represents a critical experiential attribute that influences tourists' psychological states during travel.

2.1.3. Psychological Ownership Theory (POT)

POT, rooted in organizational behavior, describes a cognitive–affective state in which individuals feel a sense of possession toward a target, perceiving it as “mine” [14]. In tourism contexts, this concept reflects tourists' emotional attachment and sense of belonging to a destination.

When individuals develop psychological ownership over a place, they are more likely to adopt a stewardship orientation, engaging in protective and responsible behaviors to preserve the value of the destination. This sense of ownership thus serves as an important psychological driver of pro-environmental actions.

Psychological ownership is incorporated in this study due to its unique capacity to capture the self–place connection that develops between tourists and natural environments. Unlike satisfaction, which reflects evaluative responses, psychological ownership represents a deeper cognitive state in which individuals perceive a destination as “theirs.” In restorative tourism contexts, natural environments not only reduce mental fatigue (as suggested by ART) but also foster emotional attachment and personal identification with the place. This sense of ownership has been shown to promote protective and responsible behaviors, as individuals are more likely to care for what they perceive as their own. Therefore, including psychological ownership in the S-O-R framework provides a stronger theoretical explanation for how perceived restorativeness leads to environmentally responsible behavior.

2.1.4. Integration of Theoretical Foundations within the S-O-R Framework

To address the limitations of prior S-O-R applications and strengthen theoretical contribution, this study develops an extended S-O-R framework by explicitly integrating Attention Restoration Theory (ART) and Psychological Ownership Theory into the organismic process.

While previous tourism studies have commonly employed the S-O-R model as a general explanatory structure, they often treat the “Organism” component as a black box, without clearly specifying the underlying psychological mechanisms. In contrast, this study advances the S-O-R framework by unpacking the internal processes through two complementary pathways: (1) a cognitive–affective evaluation (tourist satisfaction) and (2) a cognitive–emotional attachment (psychological ownership).

Specifically, the restorative environmental characteristics of a destination—conceptualized through ART and operationalized as Perceived Restorativeness—serve as the primary stimulus (S). Unlike conventional destination attributes, perceived restorativeness emphasizes the recovery of mental resources and stress reduction, thereby capturing a deeper experiential dimension of tourism environments.

These restorative stimuli influence the organismic state (O) through two distinct but interrelated mechanisms. First, consistent with experiential evaluation theories, tourists develop satisfaction as an immediate cognitive–affective response to their restorative experiences. Second, drawing on Psychological Ownership Theory, repeated or meaningful interactions with the destination foster a sense of “mine-ness,” leading to psychological ownership. Importantly, this study positions psychological ownership not merely as an outcome but as a key internal state that bridges experience and behavior.

By structuring the organismic layer in this dual-pathway manner, the model clarifies how different psychological processes jointly operate within the S-O-R framework. Satisfaction reflects short-term evaluative judgments, whereas psychological ownership captures a deeper, more enduring bond with the destination.

Finally, these organismic states drive the response (R), namely environmentally responsible behavior. Tourists who are satisfied with their experiences and feel a sense of ownership toward the destination are more likely to engage in protective and sustainable actions.

Through this integration, the study contributes to literature by refining the S-O-R framework in tourism research. Rather than applying S-O-R as a generic model, it provides a theoretically grounded explanation of how and why restorative tourism experiences translate into environmentally responsible behavior, thereby offering a more nuanced and process-oriented understanding of sustainable tourist behavior.

2.2. Hypotheses Development

2.2.1. Relationship between Perceived Restorativeness and Psychological Ownership

External environmental cues act as critical stimuli shaping tourists’ cognitive and affective responses [15]. When visitors experience a destination with strong restorative qualities, such as psychological recovery and alignment with personal needs, they are more likely to develop emotional connections with the place [16]. This emotional and sensory engagement strengthens the human–place bond, fostering a sense of belonging [17, 18]. As psychological resources are restored, tourists gradually internalize their experiences, which promotes the formation of destination psychological ownership [9, 14]. Therefore, the following hypothesis is proposed:

H1: Perceived restorativeness positively affects psychological ownership.

2.2.2. Relationship between Perceived Restorativeness and Satisfaction

Restorative destination environments play a vital role in fulfilling tourists’ core motivations, particularly the need for psychological recovery, relaxation, and escape from daily routines [8]. Prior studies consistently show that key restorative attributes, such as effortless fascination and compatibility with personal needs, significantly enhance overall travel satisfaction [2, 7]. When a destination effectively supports attention restoration and aligns with visitors’ expectations, it improves both their emotional responses and cognitive evaluations of the experience [2]. As a result, higher levels of perceived restorativeness are associated with greater tourist satisfaction.

H2: Perceived restorativeness positively affects satisfaction.

2.2.3. Relationship between Psychological Ownership and Environmentally Responsible Behavior

Grounded in the psychology of possession, when individuals cultivate a profound sense of ownership over a specific target, they inherently internalize it as a core component of their self-identity, which naturally engenders a strong moral obligation to nurture, care for, and proactively defend that entity [9]. Extrapolated to the tourism context, destination psychological ownership is highly effective in diminishing the psychological distance between

travelers and the host environment, thereby cementing a robust emotional connection and a heightened sense of territorial responsibility [5]. Consequently, this intense affective bond acts as a pivotal motivational force, compelling tourists to transition from passive consumers to active stewards and inspiring them to execute protective measures—most notably, environmentally responsible behaviors to safeguard the ecological integrity of "their" destination [5]. Therefore, the following hypothesis is formulated:

H3: Psychological ownership positively affects environmentally responsible behavior.

2.2.4. Relationship between Satisfaction and Environmentally Responsible Behavior

Grounded in cognitive appraisal theory, tourists' evaluations of their experiences shape subsequent emotions and behavioral intentions [19, 20]. When a destination meets or exceeds expectations, satisfaction emerges as a key driver of prosocial responses [21]. Empirical studies show that satisfied tourists develop greater appreciation for the natural environment, encouraging them to move beyond hedonic consumption toward environmentally responsible actions [22]. As a result, they are more likely to follow ecological guidelines and engage in sustainability practices.

H4: Satisfaction positively affects environmentally responsible behavior.

2.2.5. Direct Effect of Perceived Restorativeness on Environmentally Responsible Behavior

In addition to functioning through intermediate cognitive and affective pathways, the restorative capacity of a tourism destination can also serve as a direct antecedent to sustainable actions [2]. Extant empirical research demonstrates that profound immersion in a rejuvenating environment intrinsically heightens tourists' ecological sensitivity and fosters a self-transcendent worldview. By directly experiencing the psychological and physiological recovery provided by the setting, individuals naturally develop a profound appreciation for the intrinsic value of the local ecosystem. This spontaneous awakening of environmental consciousness acts as a primary motivational catalyst, directly compelling tourists to minimize their ecological footprint and proactively engage in environmentally responsible behaviors to preserve the restorative setting [2, 10]. Therefore, we postulate the following hypothesis:

H5: Perceived restorativeness positively affects environmentally responsible behavior.

2.3. Mediating Effects

Grounded in the Stimulus–Organism–Response (S–O–R) framework, prior studies emphasize that individuals' internal cognitive and affective states operate as a critical mechanism linking external environmental stimuli to subsequent behavioral outcomes [4]. Within this study, the perceived restorativeness of a tourism destination is conceptualized as the primary stimulus (S). This stimulus influences tourists' organismic conditions (O), namely psychological ownership and overall satisfaction, which in turn shape their likelihood of engaging in environmentally responsible behaviors (R) [2, 10].

By integrating Attention Restoration Theory and Psychological Ownership Theory under the S–O–R lens, this research posits that the restorative attributes of a destination promote sustainable behavior chiefly through internal psychological processes rather than direct behavioral activation. Specifically, immersive restorative experiences satisfy tourists' intrinsic emotional needs, fostering a stronger sense of psychological ownership while enhancing positive evaluations of the travel experience; these internal responses subsequently encourage environmentally responsible actions [9, 21].

Accordingly, psychological ownership and satisfaction are proposed as two mediating mechanisms that translate perceived restorativeness into environmentally responsible behavior. Therefore, the following hypotheses are proposed:

H6: Psychological ownership mediates the relationship between perceived restorativeness and environmentally responsible behavior.

H7: Satisfaction mediates the relationship between perceived restorativeness and environmentally responsible behavior.

Based on the theoretical foundations and prior empirical studies, seven research hypotheses were proposed. These hypotheses are systematically integrated into the overall research model as presented below (Figure 1):

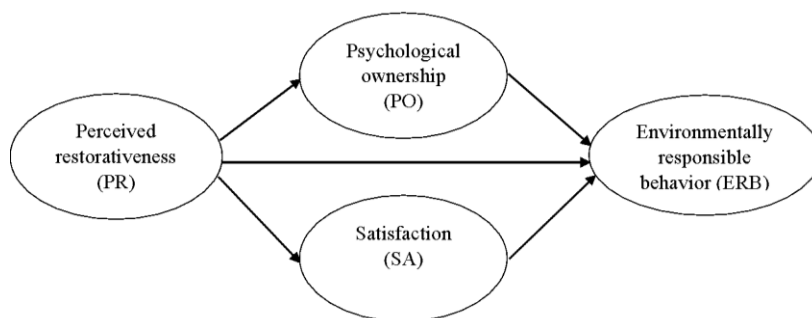


Figure 1. Research model

Source: Author's proposal

3. METHODOLOGY

3.1. Research Design and Sample

To empirically test the proposed conceptual framework, this study employed a quantitative, cross-sectional research design. Data were collected using a structured offline questionnaire administered to Ho Chi Minh City travelers who had visited coastal, island, and forest destinations in Vietnam. These destinations are characterized by high ecological value and strong restorative qualities, attracting a large number of domestic tourists seeking relaxation and contact with nature. However, the increasing number of visitors has raised concerns about sustainability, making these contexts particularly suitable for examining environmentally responsible behavior (ERB).

Participants were screened to ensure that they had direct experience with the destination environment and were at least 18 years old. Participation in the survey was entirely voluntary and anonymous. A total of 500 questionnaires were initially distributed. Following a rigorous data screening procedure, responses that were incomplete, exhibited straight-lining patterns, or failed to meet the screening criteria were excluded. As a result, 349 valid responses were retained for the final analysis. This sample size exceeds the minimum threshold required for structural equation modeling, thereby ensuring adequate statistical power for testing complex mediation relationships [11].

The use of tourists from Ho Chi Minh City can be considered appropriate for this study, as the city represents one of the largest outbound tourist markets in Vietnam. Visitors from this urban context frequently engage in nature-based tourism activities and constitute a substantial proportion of domestic travelers to coastal and forest destinations. Therefore, the sample reasonably reflects the behavioral patterns and psychological responses of a key segment of nature-based tourists in Vietnam.

3.2. Measurement Scales

All constructs included in the research model were operationalized using measurement scales adapted from established studies. Minor adjustments were made to item wording to enhance contextual suitability for the tourism environment in Ho Chi Minh City. All items were measured using a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

The survey instrument comprised four key latent constructs: Perceived Restorativeness, Psychological Ownership, Satisfaction, and Environmentally Responsible Behavior (ERB). Specifically, perceived restorativeness was measured through items capturing feelings of escape and fascination [8, 9]. Psychological ownership was assessed based on respondents’ emotional and cognitive attachment to the destination [9]. Satisfaction was evaluated through overall assessments of experience fulfillment [22, 23]. Finally, ERB was measured using items reflecting tourists’ compliance with environmental norms and their proactive efforts to protect local ecosystems [24]–[26].

3.3. Data Analysis Method

To test the proposed hypotheses and evaluate the conceptual model, this study employed Partial Least Squares Structural Equation Modeling (PLS-SEM). All analyses, including measurement model assessment and structural model evaluation, were conducted using SmartPLS 4. The selection of PLS-SEM over covariance-based SEM (CB-SEM) is supported by several methodological considerations aligned with the objectives of this study [11].

Firstly, PLS-SEM is inherently prediction-oriented, making it particularly suitable for research aiming to explain and predict key endogenous constructs [11]. Given that this study focuses on predicting environmentally responsible behavior by uncovering its underlying psychological drivers, PLS-SEM provides strong predictive performance and maximizes explained variance [9]. This feature is especially advantageous for examining behavioral outcomes in tourism contexts [5].

Secondly, PLS-SEM is well suited to analyzing complex models involving multiple mediating relationships [11]. The proposed model incorporates several latent constructs and indirect pathways, including the mediating roles of psychological ownership and satisfaction. Prior methodological research indicates that PLS-SEM offers superior flexibility and statistical power when estimating such complex relationships [9].

Moreover, PLS-SEM does not require strict assumptions regarding data normality, which is often violated in survey-based tourism research. This characteristic enhances the robustness and reliability of the estimation results, particularly for mediation analysis involving multiple indirect effects [4], [5].

4. RESULTS

4.1. Descriptive Statistics

The sample consists of 349 respondents, with a slightly higher proportion of females (51.86%) than males (48.14%). In terms of age distribution, the majority of participants fall within the 31–40 age group (30.95%), followed by those aged 41–50 (24.93%), over 50 (23.21%), and 18–30 (20.92%). Regarding educational attainment, most respondents hold an undergraduate degree (58.45%), while 22.35% have postgraduate qualifications and 19.20% possess education below the undergraduate level.

Table 2. Sample Characteristics

Sample Characteristics	Category	Frequency	Percentage (%)
Gender	Male	168	48.14%
	Female	181	51.86%
Age	18–30	73	20.92%
	31–40	108	30.95%
	41–50	87	24.93%
	> 50	81	23.21%
Education Level	Below Undergraduate	67	19.20%
	Undergraduate	204	58.45%
	Postgraduate	78	22.35%

Source: Author's own analysis

4.2. Measurement Model Assessment

The measurement model was rigorously evaluated in accordance with the guidelines proposed by Hair et al. (2022). Firstly, indicator reliability was examined through outer loadings. All observed indicators exhibited loadings above the recommended threshold of 0.70, ranging from 0.726 to 0.881. These results indicate that each measurement item has a strong association with its corresponding latent construct and contributes adequately to construct representation. No indicator required removal, as all loadings satisfied the acceptable criteria.

Table 3. Reliability and validity

Variable/item	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ERB		0.811	0.817	0.876	0.640
ERB1	0.728				
ERB2	0.846				
ERB3	0.852				
ERB4	0.766				
PO		0.824	0.824	0.895	0.740
PO1	0.846				
PO2	0.881				
PO3	0.853				
PR		0.876	0.876	0.904	0.573
PR1	0.754				
PR2	0.760				
PR3	0.747				
PR4	0.751				
PR5	0.764				
PR6	0.726				
PR7	0.797				
SA		0.723	0.731	0.843	0.642
SA1	0.770				
SA2	0.842				
SA3	0.790				

Source: Author's own analysis using SmartPLS 4

Secondly, internal consistency reliability was assessed using both Cronbach's alpha and composite reliability (CR). The Cronbach's alpha values ranged from 0.723 to 0.876, while composite reliability values varied between 0.843 and 0.904. All values exceeded the recommended threshold of 0.70, confirming that the constructs demonstrate satisfactory internal consistency and reliability. Notably, composite reliability values were consistently higher than Cronbach's alpha, further supporting the robustness of the measurement scales.

Thirdly, convergent validity was confirmed as the average variance extracted values (0.573–0.740) exceeded the 0.50 threshold. This indicates that each construct captures more than half of the variance of its indicators, thereby confirming adequate convergent validity.

Finally, discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT) and Fornell-Larcker criterion, which is considered a more stringent criterion than traditional approaches. The HTMT values among all construct pairs ranged from 0.708 to 0.824, remaining below the conservative threshold of 0.85. Moreover, the Fornell–Larcker criterion is met. These findings confirm that each construct is empirically distinct and measures a unique conceptual domain, thus establishing discriminant validity.

Table 4. Discriminant validity—Heterotrait-Monotrait (HTMT) Matrix

	ERB	PO	PR	SA
ERB				
PO	0.824			
PR	0.713	0.763		
SA	0.783	0.708	0.725	

Source: Author's own analysis using SmartPLS 4

Table 5. Discriminant validity—Fornell-Larcker criterion

	ERB	PO	PR	SA
ERB	0.800			
PO	0.678	0.860		
PR	0.604	0.650	0.757	
SA	0.619	0.558	0.580	0.801

Source: Author's own analysis using SmartPLS 4

Overall, the results provide strong evidence that the measurement model satisfies all reliability and validity criteria.

4.3. Structural Model Assessment

The structural model was evaluated to examine the hypothesized relationships, predictive power, and overall model performance in accordance with Hair et al. (2022).

4.3.1. Collinearity Assessment

Collinearity among predictor constructs was assessed using the variance inflation factor (VIF). All VIF values ranged from 1.648 to 1.967, indicating that multicollinearity is not a concern and that the structural estimates are reliable.

Table 6. Collinearity Assessment (Inner VIF Values)

	ERB	PO	PR	SA
ERB				
PO	1.895			
PR	1.967	1.000		1.000
SA	1.648			

Source: Author's own analysis using SmartPLS 4

4.3.2. Path Coefficients and Hypothesis Testing

The significance of the structural relationships was assessed using bootstrapping procedure with 5,000 subsamples, a two-tailed test, and a significance level of 5%. The results indicate that all hypothesized paths are positive and statistically significant.

Specifically, psychological ownership has a strong positive effect on environmentally responsible behavior ($\beta = 0.403$, $p < 0.001$), while satisfaction also exerts a significant positive influence ($\beta = 0.295$, $p < 0.001$). Perceived restorativeness directly impacts environmentally responsible behavior ($\beta = 0.171$, $p < 0.001$), although with a comparatively smaller effect size. Furthermore, perceived restorativeness significantly affects both psychological ownership ($\beta = 0.650$, $p < 0.001$) and satisfaction ($\beta = 0.580$, $p < 0.001$), indicating that restorative experiences play a critical role in shaping tourists' internal psychological states. These findings provide full support for all proposed hypotheses.

4.3.3. Coefficient of Determination (R^2)

The R^2 value for environmentally responsible behavior is 0.559, indicating moderate to substantial explanatory capability. Similarly, psychological ownership ($R^2 = 0.423$) and satisfaction ($R^2 = 0.336$) exhibit moderate levels of explained variance. These results suggest that the model effectively captures key determinants of tourists' behavioral outcomes.

4.3.4. Effect Size (f^2)

The effect size analysis further clarifies the relative importance of each predictor. Perceived restorativeness has a large effect on psychological ownership ($f^2 = 0.733$) and satisfaction ($f^2 = 0.507$). In contrast, its direct effect on environmentally responsible behavior is small ($f^2 = 0.034$).

Among the mediators, psychological ownership demonstrates a medium effect on environmentally responsible behavior ($f^2 = 0.194$), whereas satisfaction shows a small-to-medium effect ($f^2 = 0.120$). These findings highlight the dominant role of indirect psychological mechanisms.

Table 7. Hypothesis Testing Results

Hypothesis	Relationship	Original sample (O)	Standard deviation (STDEV)	T statistics (O/STDEV)	f-square	P values	Significant
H1	PR -> PO	0.650	0.028	22.898	0.733	0.000	Accept
H2	PR -> SA	0.580	0.038	15.438	0.507	0.000	Accept
H3	PO -> ERB	0.403	0.044	9.110	0.194	0.000	Accept
H4	SA -> ERB	0.295	0.045	6.517	0.120	0.000	Accept
H5	PR -> ERB	0.171	0.049	3.485	0.034	0.000	Accept
H6	PR -> PO -> ERB	0.262	0.031	8.527		0.000	Accept
H7	PR -> SA -> ERB	0.171	0.028	6.180		0.000	Accept

Source: Author's own analysis using SmartPLS 4

4.3.5. Predictive Relevance (Q^2 and $Q^2_{predict}$)

The predictive relevance of the model was assessed using the blindfolding procedure. All endogenous constructs exhibit positive Q^2 values (ERB = 0.348; PO = 0.310; SA = 0.211), confirming that the model has adequate predictive relevance.

Additionally, Q²predict values are all positive, further supporting the model’s out-of-sample predictive capability. The relatively low RMSE and MAE values indicate that the model produces accurate predictions across all endogenous constructs.

Table 8. Predictive Relevance and Predictive Performance Assessment

	Q ² (=1-SSE/SSO)	Q ² predict
ERB	0.348	0.360
PO	0.310	0.418
PR	0.000	
SA	0.211	0.331

Source: Author’s own analysis

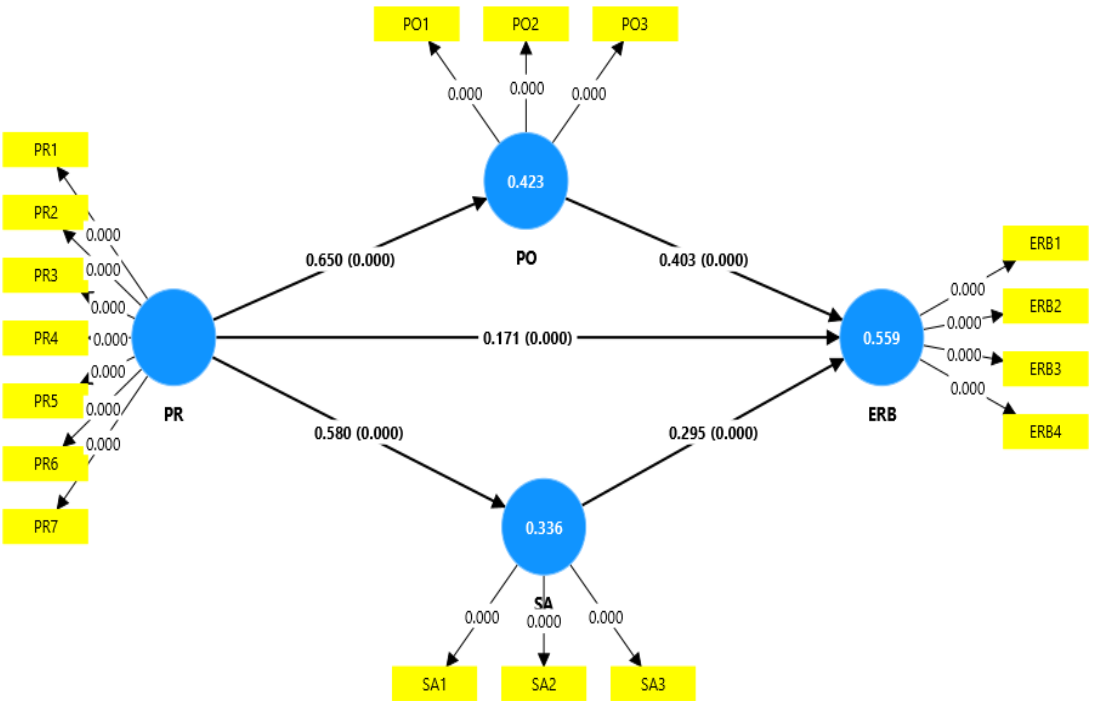


Figure 2. Structural Model Results

Source: Author’s own analysis

4.4. Mediation Analysis

The mediating roles of psychological ownership and satisfaction were examined using bootstrapping procedures in line with Hair et al. (2022). The results indicate that the total effect of PR on ERB is positive and significant ($\beta = 0.433$, $p < 0.001$). The indirect effect via psychological ownership is significant ($\beta = 0.262$, $t = 8.527$, $p < 0.001$), with a confidence interval [0.204, 0.323], confirming its mediating role. Similarly, the indirect effect through satisfaction is also significant ($\beta = 0.171$, $t = 6.180$, $p < 0.001$; CI [0.118, 0.227]). Importantly, the direct effect of PR on ERB remains significant ($\beta = 0.171$, $p < 0.001$), indicating partial mediation.

Comparatively, psychological ownership demonstrates a stronger mediating effect than satisfaction, suggesting that emotional attachment plays a more prominent role in translating restorative experiences into environmentally responsible behavior.

Overall, both mediators significantly transmit the effect of PR on ERB, thereby supporting H6 and H7.

Table 9. Indirect Effects and Bootstrapping Results

	Original sample (O)	Sample mean (M)	2.5%	97.5%
PR -> PO -> ERB	0.262	0.263	0.204	0.323
PR -> SA -> ERB	0.171	0.171	0.118	0.227

Source: Author's own analysis using SmartPLS 4

5. DISCUSSION

5.1. Theoretical Implications

The empirical findings of this study offer several profound theoretical contributions to the existing literature on sustainable tourism and environmental psychology. First, this research successfully extends the Stimulus-Organism-Response (S-O-R) paradigm by introducing a dual-mediation mechanism. While previous studies have extensively utilized the S-O-R framework to predict behavioral intentions, they often relied on a single mediator [4]. By simultaneously incorporating psychological ownership and satisfaction as organismic states, this study provides a more comprehensive explanation of how external environmental stimuli (perceived restorativeness) are cognitively and affectively processed before translating into pro-environmental responses [10].

Second, the current study breaks new ground by conceptually integrating Attention Restoration Theory (ART) with Psychological Ownership Theory. While ART has traditionally been used to explain cognitive recovery and well-being outcomes, this study extends its explanatory scope by demonstrating that restorative environments also foster self-place integration, which is a key antecedent of psychological ownership. Specifically, the findings suggest that experiences of restorativeness do not merely reduce mental fatigue but also enhance tourists' psychological attachment by facilitating the internalization of the destination into the extended self. This insight advances prior research by shifting the focus from restoration as a passive recovery process to restoration as an active psychological transformation process that shapes possession and behavior toward that locale [9].

Finally, the study successfully delineates the psychological mechanism underlying environmentally responsible behavior (ERB). The results from the mediation analysis confirm a significant total effect of perceived restorativeness on ERB ($\beta = 0.433$, $p < 0.001$). This finding elucidates the "good feelings to good behavior" phenomenon, confirming that intrinsic psychological fulfillment and a sense of destination ownership are mandatory preconditions for tourists to transition from passive visitors to active environmental stewards [25].

5.2. Comparison with Prior Studies

The results are broadly consistent with prior studies demonstrating the positive influence of restorative environments on well-being, satisfaction, and pro-environmental behavior [2-10]. The mediating role of psychological ownership also aligns with earlier findings highlighting its importance in fostering tourists' protective and citizenship behaviors [9].

However, this study extends the literature by addressing inconsistencies regarding the role of satisfaction. While some studies suggest that hedonic satisfaction may encourage self-indulgent behavior, the present findings indicate that the behavioral consequences of

satisfaction depend on its contextual embedding. When satisfaction arises from restorative environmental experiences and is reinforced by psychological ownership, it supports rather than undermines pro-environmental action.

This insight suggests that prior inconsistencies may stem from treating satisfaction as a context-free construct. By contrast, this study demonstrates that its effect is conditional and relational, shaped by the broader psychological system in which it is embedded. As such, the findings advocate for a shift from examining isolated mediators to analyzing interdependent psychological configurations in tourism behavior research.

5.3. Practical Implications

From a practical perspective, the findings provide actionable insights for Destination Management Organizations (DMOs) and tourism policymakers. First, DMOs must prioritize the design and maintenance of restorative environments. Given that restorativeness acts as the primary stimulus for ERB, destination planners should preserve authentic natural landscapes, minimize commercial noise, and create tranquil zones that facilitate tourists' psychological recovery and fascination [8].

Second, tourism operators should implement strategies to enhance emotional attachment and psychological ownership among visitors. This can be achieved by encouraging tourists to participate in local environmental conservation initiatives, offering personalized eco-tours, or creating interactive programs that allow visitors to leave a positive, lasting legacy at the destination. When tourists feel they are stakeholders in the destination, their commitment to protecting it amplifies [9].

Third, DMOs can improve sustainable tourism strategies by integrating restoration-focused marketing. Instead of merely imposing restrictive environmental regulations, which may trigger tourist reactance, managers should craft marketing campaigns that emphasize the healing and rejuvenating benefits of the destination. Fostering positive emotional states organically nurtures compliance with eco-friendly guidelines, ensuring long-term destination sustainability [25].

6. CONCLUSION

This study embarked on an empirical investigation to unravel the complex psychological pathways that foster tourists' environmentally responsible behavior. By integrating the S-O-R paradigm with Attention Restoration Theory and Psychological Ownership Theory, the research validated a robust conceptual model. The key findings reveal that perceived restorativeness significantly and positively influences both psychological ownership and satisfaction, which subsequently act as dual mediators driving ERB. The structural model demonstrated excellent out-of-sample predictive capability, confirming the critical role of positive internal psychological states. Ultimately, this study contributes to the sustainable tourism discourse by proving that destination environments designed for human psychological restoration inherently cultivate environmental stewardship. Promoting tourist well-being and protecting the destination's ecological integrity are mutually reinforcing endeavors.

7. LIMITATIONS

This study is subject to several limitations that pave the way for future research. Primarily, the research utilized a cross-sectional design. This approach limits the ability to draw definitive causal inferences between restorative stimuli and actual long-term behavior. Future studies should employ longitudinal to track how tourists' post-trip behaviors evolve over time.

Second, it is necessary to acknowledge the limitations related to the representativeness of the sample. The data were collected from visitors from Ho Chi Minh City, and the convenience sampling method was used. Although this group represents an important segment of domestic travelers, the findings may not be fully generalized for groups of travelers from other regions. Therefore, future research should replicate and validate the proposed model using more diverse and representative samples to enhance the generalizability of the results.

Finally, this study primarily focuses on direct and mediating relationships without explicitly examining moderating factors. Future research could extend the model by conducting multi-group analyses (MGA) to investigate how demographic characteristics (e.g., gender, age, cultural background) and travel-related factors (e.g., first-time versus repeat visitors) influence the proposed relationships. Such an approach would provide more nuanced and segmented insights into sustainable tourist behavior [11].

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