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Article

From Intention to Action: Modeling Post-Visit Responsible Behavior in Ecotourism

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Abstract

The promise of sustainability of ecotourism relies on comprehending the psychological mechanism that converts experience into post-visit environmental concern. This research formulates and examines a model that connects three antecedents—Perceived Trip Quality (PTQ), Aesthetic/Spiritual Experience (ASE), and Environmental Concern (EC)—with Responsible Post-Visit Behavior (RPB) through two mediators: Tourist Satisfaction (SAT) and Personal Norms (PN). Structural equation modeling based on a quantitative, cross-sectional design examined survey responses from 585 Greek ecotourists. All three precursors meaningfully predicted RPB, directly and indirectly through SAT and PN, with partial mediation on all but the direct pathway. Mediation effects also named PN a stronger channel than SAT, particularly in converting affective and moral involvement into stable intentions. Multi-group tests for gender, age, education, environmental orientation, and previous ecotourism experience revealed significant differences; younger, inexperienced, and high-orientation tourists were more sensitive to normative and affective mechanisms. The research develops environmental and tourism psychology by combining value-based and experience-based routes to post-visit action. Practical recommendations are made to policymakers, educators, and operators to develop transformational, norm-activating experiences.

Keywords: ecotourism responsible behavior; structural equation modeling (SEM); environmental concern; tourist satisfaction; personal norms; aesthetic experience; sustainable tourism



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1. Introduction

Ecotourism, broadly speaking, is environmentally sound travel to natural attractions in a manner that maintains the integrity of the environment and benefits local communities, and has become a central policy instrument for developing tourism sustainability (Al-Amoudi, 2018; Ismail et al., 2021). As global concern about climate change, biodiversity loss, and environmental degradation grows, ecotourism presents an attractive vehicle for promoting awareness, knowledge, and action towards pro-environmental behavior. In addition to its economic and conservation value, ecotourism is also of great interest due to

its potential to cause psychological and emotional changes among tourists, which can have long-term effects on attitudes and behaviors toward the environment (Ágoston et al., 2022; Ballantyne & Packer, 2005; Duong et al., 2022).

Even under such pledges of change, empirical evidence on ecotourism's effects on sustainable behavior is mixed (Carvache-Franco et al., 2021; Gao et al., 2023). While vast tourist majorities report increased environmental awareness through or shortly after the ecotourism experience, the degree to which such experience actually finds expression in material post-visit behavior, such as environmentalism, philanthropy, or change in lifestyle, is still undecided. This well-documented intention–behavior gap is an important standard for tourism and environmental psychology (Carvache-Franco et al., 2021; Gao et al., 2023). Tourists might intend to behave in a sustainable manner but not do so when they go back to their everyday conditions, where social norms and other claims compete with pro-environmental intention (Hassan et al., 2021; Lee & Jan, 2018). Therefore, it is necessary to learn about the processes that facilitate or constrain this switch from intention to behavior.

Several theoretical models have attempted to account for pro-environmental action, the most popular of which is the value–belief–norm (VBN) theory (Rafiq et al., 2022; Rosmadi et al., 2024). VBN theorizes a chain from values to awareness of consequences to ascription of responsibility to Personal Norms that affect behavior. Extending VBN, the Experience Economy view contends that richly memorable, affect-laden experiences can alter later choice. In environmental psychology, awe and nature connectedness are associated with self-transcendence and moral elevation, which can increase personal commitment to act (Sorcaru et al., 2025; Ting et al., 2025). However, few ecotourism studies have combined these views to study how values before the visit, experiential quality at place, and emotional responses interact to build post-visit behavior.

In addition, whereas concepts like environmental concern, satisfaction, and trip quality have each been linked to tourist behavior, they are seldom combined into an integrated model that captures both the experiential and psychological routes to sustainable action after the trip (L. Wang et al., 2025; Wu et al., 2024). Notably, ASE—awe, wonder, and sense of felt connection with nature—is not extensively examined as an activator of PN elicitation and resultant behavior in tourism. We position ASE particularly as an affective cue that can enhance PN through self-downward comparison and moral salience, complementing more cognitive pathways through EC and PTQ (Duong et al., 2022; Ismail et al., 2021). Such an under-study emphasizes the necessity for a more convergent model that considers how levels of experience and psychology intersect to affect responsible post-visit behavior (RPB).

In spite of extensive investigation into learning and satisfaction in ecotourism, there are four gaps. Firstly, theory is disjointed: VBN-based explanations of moral activation do not incorporate experiential affect (e.g., awe, transcendence, nature connectedness), and it is therefore uncertain how values and emotions together influence behavior post-visit. Secondly, mediating processes are under-defined; Satisfaction and Personal Norms are explained but not typically modeled jointly as parallel pathways from experience to behavior. Third, effects are typically intentions assessed in situ; confirmation of responsible behavior post-visit is still scarce. Fourth, heterogeneity is rarely investigated, restricting conclusions on for whom and under what conditions the effects are strongest. To fill these gaps, this study develops and validates a structural model connecting Environmental Concern (EC), Perceived Trip Quality (PTQ), and Aesthetic/Spiritual Experience (ASE) to Responsible Post-Visit Behavior (RPB) through Satisfaction (SAT) and Personal Norms (PN) as double mediators and investigates subgroup differences through multi-group analysis. The model thereby connects value-based (VBN) routes with affective–experiential processes, considers behaviorally targeted post-visit action, and offers evidence on moderated mechanisms for program design.

Amid ongoing intention–behavior gaps in ecotourism, we suggest that post-visit environmental behavior is optimally predicted by the convergence of cognitive (environmental concern, EC), experiential (perceived Trip Quality, PTQ), and affective–transcendent (Aesthetic/Spiritual Experience, ASE) inputs with two proximal processes—Satisfaction (SAT) and Personal Norms (PN). To this end, we formulated and validated a structural equation model (SEM) connecting EC, PTQ, and ASE to Responsible Post-Visit Behavior (RPB) via SAT and PN. To test this model empirically, we conducted a cross-sectional online survey of adults who had undertaken an ecotourism experience in the last six months, recruited purposively through ecotourism operators, sustainability networks, and university eco-clubs. Validated psychometric scales (e.g., NEP/VBN-based measures, satisfaction scales, and a contextualized awe measure for ASE) developed for post-trip reflective context were used, with five-point Likert formats congruent with the source instruments and SEM conventions. The survey was open for three months (January–March 2025), with two reminder waves ~3–4 weeks apart. Sample size and item design are consistent with contemporary SEM guidelines for model fit and subgroup analyses, which permit estimation of direct and mediated paths and testing of heterogeneity through multi-group analysis.

Though previous research has investigated the short-term effect of ecotourism on learning acquisition or in-trip satisfaction (Pham & Khanh, 2021; Romero-Brito et al., 2016; Sahahiri et al., 2023), few studies have followed up to see how these experiences then transfer to behavior outside the tourism setting. Even fewer have mapped mediating processes, especially affectively charged experience and internalized normative views, in explaining how and why sustainable behavior is or is not taken up following the trip. Limited work also combines both prior values (e.g., concern) and in situ factors (e.g., trip quality, awe) in the same analytical model, especially with strict structural modeling methods. These limitations constrain theory building and applied design (Sana et al., 2023; Sitompul, 2024). Although our concern is with proximal, behaviorally specific post-visit change, we recognize that gains of this type can be on a more general transformational trajectory so that awe-suffused experiences and meaning-making are followed by more profound values and identity change. We therefore situate RPB as a proximal post-visit measure that is theoretically consistent with, but analytically separate from, transformation tourism (X. Chen & Cheung, 2025).

This study has significant theoretical, empirical, methodological, and practical implications. Theoretically, it combines cognitive (EC, PTQ), affective (ASE, SAT), and normative (PN) mechanisms in a single structural model that connects VBN to experience-based affective processes. Methodologically, it uses an adequately powered SEM design with psychometrically sound measures to examine mediation and moderation. Empirically, it introduces ASE as a separate precursor of RPB through SAT and PN. In practice, it provides cues to shape ecotourism such that sustainable alternatives become seen as within reach (through PN-congruent cues) and worthy (ASE/SAT). Supported by brief previews of consequences, environmental attitude, Perceived Trip Quality, and Aesthetic–Spiritual Experiences directly and indirectly affect Post-Visit Responsible Behavior through Satisfaction and Personal Norms. Both affective (SAT) and normative (PN) paths are supported in mediation analyses, and multi-group analyses determine systematic age, gender, education, environmental orientation, and ecotourism experience differences.

The rest of the paper is organized as follows: Section 2 presents a review of ecotourism, environmental concern, and behavior outcome literature, which serves as a theoretical background for the study. Section 3 presents the conceptual model and hypotheses. Section 4 presents the methodology in the form of survey design, sampling, and SEM approach. Section 5 reports direct effects, mediation analysis, and multi-group comparison results.

Section 6 reflects on real-world applications to tourism stakeholders. Finally, Section 7 ends with the study limitations and future research recommendations.

2. Literature Review and Hypotheses Development

2.1. Predictors and Behavioral Outcomes in Ecotourism Research

Knowledge of the experiential and psychological predictors of sustainable ecotourism behavior has become increasingly important as researchers seek to identify how tourist experience influences long-term pro-environmental activism. Most recent research is focused on the fact that the environmental concern of tourists, trip quality, and affective experience are key predictors of their post-trip action (Wondirad, 2019; Wut et al., 2023). These aspects, however, have not been uniformly integrated or correctly modeled under one integrated theory of behavior, and there is potential for theoretical and empirical development (Ballantyne & Packer, 2005; Buonincontri et al., 2017).

Numerous studies have evidenced the role of environmental values and value orientations in influencing travel intentions and pro-environmental actions. For example, Mandal et al. (2025) reveal that social, economic, and environmental orientations play a significant role in determining slow travel experiences and destination behaviors, whose effects are moderated by situational factors like authenticity and materialism. Likewise, Y. H. Lin and Lee (2020) build a strong causal relationship that binds recreation experience, environmental attitude, place attachment, and environmentally conscious behavior together. Such findings reflect the significance of experience quality but tend not to explain how emotional or spiritual aspects of the experience may function to mediate the connection.

Awe, Aesthetic–Spiritual Experience, and Nature Connectedness. Awe states elicited with perceived vastness and “small-self” analysis can divert attention away from self-interest toward prosociality and biospheric concerns (Wondirad, 2019; Wut et al., 2023). This route has been associated with increased generosity, moral concern, and nature connectedness in laboratory and field contexts. In a VBN/NAM model, these affective states can plausibly increase awareness of consequences and ascription of responsibility and thus induce Personal Norms of environmental action; in TPB, they are optimally achieved when destinations also offer low-effort, easily accessible sustainable alternatives that induce perceived behavioral control (X. Chen & Cheung, 2025). In tourism, this means that ASE is a supplementary affective lever that should be allied with design elements that make sustainable choices easy to choose and see. Existing work also hints at more under-researched but growing applicability predictors, including aesthetic and spiritual experience. X. Chen and Cheung (2025) discover that biodiverse aesthetic quality not just influences perceived environmental benefits and satisfaction but also impacts pro-environmental behavior indirectly via tourist well-being. Similarly, Mohammad Nasir et al. (2024) observe that aesthetic and symbolic design affordances in ecotourism environments influence environmental identity, which predicts sustainable behavior. Such studies highlight the importance of studying experiential aspects as opposed to functional qualities, and affective involvement and personal interpretation are key to developing post-tour environmental responsibility.

Trip quality and perceived value also emerge as robust antecedents of sustainable behavior. Kim and Thapa (2018) established that perceived quality, emotional value, and flow experience are predictors of satisfaction and environmentally responsible behavior. This is congruent with previous research by Ballantyne and Packer (2005), who emphasized the importance of affectively engaging, free-choice learning experiences as the basis of environmental responsibility. In spite of such findings, most research has concentrated on short-term behavioral intentions or self-reported attitudes and not on actual post-trip behavior, where there is an inadequacy of modeling sustained involvement beyond the tourist destination.

Moreover, concepts of environmental identity (Xue et al., 2020) and nature connectedness (Çiğdemli & Avcı, 2023) have recently surfaced as explanatory variables for both destination preference and visit intention. Personal Norms and Satisfaction as mediators in these relationships are, however, under-theorized. Research as that of T. H. Le et al. (2021) and Y. H. Lin and Lee (2020) supports the explanatory value of value–belief–norm continua and landscape cognition in influencing behavior, but few have tested these mechanisms combined within ecotourism frameworks.

Moreover, studies are still struggling with conceptual ambiguity in visitor experience modeling. As Mandić and McCool (2023) note, in spite of abundant scholarly output, nature-based tourist experience definitions are disjointed and operationalized in a manner that is incoherent. Such conceptual opacity stifles cumulative theory growth and impedes the possibility of translating findings into practice.

Most provocatively, Jamal and Smith (2017) offer the pedagogical perspective that educationally rich tourism experiences—that is, those that enable reflection, environmental learning, and civic responsibility—may be the key to closing the intention–behavior gap. Their emphasis on tourists as co-producers of climate knowledge and action extends the scope within which behavioral outcomes are envisioned, and it chimes with arguments that pro-environmental involvement is an outcome of not just cognitive processing but also affective and ethical resonance.

Collectively, these studies provide useful insight into the variety of psychological, social, and experiential variables that shape pro-environmental behavior in tourism settings. There is, however, an evident need to consolidate these variables within an explanatory framework. In particular, the mediating influences of Satisfaction and Personal Norms—key processes argued to elevate experience to behavior—are rarely entertained together (Carvache-Franco et al., 2021; Dunlap et al., 2000; Gupta et al., 2025). Moreover, although the affective and spiritual aspects of experience are more recognized, their influence is less investigated compared to more traditional cognitive processes.

This research fills these lacunae by empirically examining a structural model featuring Environmental Concern, Perceived Trip Quality, and Aesthetic/Spiritual Experience as antecedents of responsible post-visit action. It also entertains the mediating functions of Satisfaction and Personal Norms—constructs corroborated by both VBN-based logic and experiential design theory—in motivating pro-environmental commitment once the tourism experience has been concluded. In so doing, it offers a more comprehensive and psychologically more informed explanation of how ecotourism generates sustainable behavioral impacts. To this end, the following hypotheses are proposed to empirically test these relationships:

H1. *Environmental Concern (EC) has a direct positive effect on Responsible Post-Visit Behavior (RPB).*

H2. *Perceived Trip Quality (PTQ) has a direct positive effect on Responsible Post-Visit Behavior (RPB).*

H3. *Aesthetic/Spiritual Experience (ASE) has a direct positive effect on Responsible Post-Visit Behavior (RPB).*

2.2. Theoretical Frameworks Informing Ecotourism Behavior

As an appreciation of the psychological and normative mechanisms operating in sustainable tourist behavior has compelled scholars to make ever greater use of inclusive theoretical frameworks, the most well-known among them is the value–belief–norm (VBN) theory. This approach rests on the assumption that values (biospheric, altruistic, and

egoistic) call forth beliefs regarding environmental outcomes, which in turn result in personal norms that govern pro-environmental action (Alashiq & Aljuhmani, 2025; Gupta et al., 2025; T. H. Le et al., 2021). Many of these studies have applied this framework to tourism environments, highlighting its applicability to understanding tourists' behavioral intentions and post-tour sustainability behaviors.

More recently, researchers have integrated the VBN model with tourism-focused antecedents like eco-destination image (Alashiq & Aljuhmani, 2025), environmental knowledge (Jayasekara et al., 2024), and identity concepts (He et al., 2024). Such studies always supplement the explanatory capability of the model that altruistic and biospheric orientations are strong values influencing person norms, which in turn decide behavior outcomes like readiness to adopt sustainability, engage in conservation, or pay extra for ecotourism service.

Meanwhile, scholars have shown that there are strong moderators and mediators to the value–norm–behavior chain. For example, Assaker (2025) established that altruism mediates the effect of SDG issues on sustainable travel intentions and moderates the effect of such concerns, thereby not only dictating behavior through value orientations but also mediating the effect of global paradigms of sustainability on personal choices. According to this, Lotfavi et al. (2025) noted age distinctions between value–behavior relationships and differential age-related social norm effects—hinting at the need to incorporate development or life-stage explanations in VBN models.

In addition to the cognitive–normative pathway of VBN theory, recent studies have examined the inclusion of affect and identity constructs as well. The value–identity–personal norm (VIP) model, as proposed by Y. Lin et al. (2025) and Yin (2024), suggests that environmental self-identity and moral obligation are mediating variables for values' influence on action, especially when high cost or sacrifice is at stake. This is particularly true of ecotourism, since sustainable actions like exerting an environmentally friendly choice or donating to conservation efforts tend to require effort or cost. Environmental psychology's low-cost/high-cost continuum of sustainable actions has been cross-validated in tourism contexts, with personal norms acting as an even more powerful determiner in high-cost situations (Yin, 2024).

The dynamic interactivity of normative belief and experience input can also be seen in models that have incorporated elements of the Experience Economy. L. Wang et al. (2024), for instance, found that abstract concepts like eco-destination image and environmental awareness lead to sustainable value internalization and social interaction among tourists. Such a finding indicates that affectively rich and pedagogically intensive experiences can act as catalysts for the activation of the VBN pathway—converting broad values into personal norms that can be converted into behavior.

Additionally, cultural context is also believed to play a determining role in the way these frameworks function. In collectivist cultures, as T. T. T. Thuy et al. (2025) and Z. Wang et al. (2023) noted, more intense norms of pressures and greater susceptibility to collective values directly impact the effects of personal norms on sustainable consumption behavior. These findings contradict the assumed universality of behavioral intention as a mediator and demonstrate the necessity for culturally aware models of tourist behavior.

Collectively, these studies attest to the strength and durability of VBN-based models in ecotourism research (Gupta et al., 2025; He et al., 2024; Landon et al., 2018). While individual norms are stable predictors of sustainable behavior, there is increasing recognition that their activation rests not only on internalized values but also on situational contingencies such as the salience of identity, environmental awareness, and affective qualities of tourist experiences. Despite these advances, the literature remains patchwork in its conceptualization and empirical examination of experience-based variables—e.g., aesthetic and spiritual

involvement—giving rise to normative commitments (Jayasekara et al., 2024; Y. Lin et al., 2025; Lotfavi et al., 2025).

Building on this foundation, we place each construct clearly in its theoretical history. Environmental concern (EC) refers to the values on beliefs component of the VBN model, encompassing descriptions of environmental impact that, if salient, have the potential to instill moral obligation (personal norms) (Alashiq & Aljuhmani, 2025; Gupta et al., 2025; T. H. Le et al., 2021). Personal Norms (PN) define the norm activation terminal element of VBN/NAM—internalized duties to “do the right thing” that are always close to behavior. Satisfaction (SAT) is an affective–cognitive post-experience measure that captures learning and meaning (Assaker, 2025) and, in turn, strengthens or weakens the translation of experience and values to action in tourism settings. Perceived Trip Quality (PTQ) positions the Experience Economy pathway (T. T. T. Thuy et al., 2025): quality, well-translated experiences maximize understanding, perceived relevance, and memorability, and hence maximize SAT and can prime PN (Gupta et al., 2025; He et al., 2024; Landon et al., 2018). Lastly, Aesthetic/Spiritual Experience (ASE) leverages environmental psychology’s theory on self-transcendent emotions—most notably, awe—characterized as a felt vastness and motivational need for accommodation. Awe and accompanying nature connectedness sentiments are associated with a “small self,” increased prosociality, and intentions to steward (Gupta et al., 2025; He et al., 2024; Landon et al., 2018). In our theory, ASE is taken to catalyze PN (moral elevation/responsibility) and boost SAT (significant, transforming evaluations), thus offering a psychologically independent route—alternative to VBN’s cognitive–normative progression—by which ecotourism experiences trigger responsible post-visit behavior.

Transformational tourism considers travel a stimulus for long-term changes in attitudes, identity, and behavior. In this framework, our model decrees a short-term transformation path: Aesthetic/Spiritual Experience (ASE) serves as the affective–transcendent catalyst (subjective vastness, small self, connectedness), subsequently internalized through meaning-making into Personal Norms (PN)—commitment-like imperatives stabilizing behavior post-trip. Perceived Trip Quality (PTQ) provides the cognitive structure (understanding, efficacy, value alignment), and Environmental Concern (EC) provides motivational orientation towards biospheric aspirations. Responsible post-visit behavior (RPB) then offers a proximal, behavioral measure of transformational influence. This model builds on previous logic (Jamal & Smith, 2017) in explaining how awe-inspiring experiences (ASE) are internalized (ASE→PN) and where experience design (PTQ) and prior values (EC) enter the picture, providing an explanation of why PN was the more dominant mediator in our findings.

The current research attempts to close this gap by coupling VBN-based cognitive–normative processes with the experiential and affective aspects of ecotourism. In particular, it incorporates constructs of Aesthetic/Spiritual Experience as precursors of Satisfaction and Personal Norms, thus providing a more comprehensive explanation of the process by which trip experiences are converted into post-visit sustainable behavior. In so doing, it addresses the demands for ecotourism models connecting value-based beliefs to emotionally engaging, transformative experiences with the potential to trigger long-term behavior change. Thus, the following hypotheses were formed:

H4a. *Tourist Satisfaction (SAT) has a direct positive effect on Responsible Post-Visit Behavior (RPB).*

H4b. *Personal Norms (PN) have a direct positive effect on Responsible Post-Visit Behavior (RPB).*

2.3. Mediating Mechanisms Between Experience and Action

The association between post-visit sustainable behavior and ecotourism experience is not only straightforward but, in most cases, is also indirect and mediated by norm, cognitive, and affective psychological processes (Cheng & Wu, 2015; Hansen et al., 2024; Isa, 2024). Of these, Tourist Satisfaction and Personal Norms have emerged as significant mediators in the conversion of experiential experiences into behavioral responses (Javed et al., 2025; Jiang et al., 2018; N. Le et al., 2025).

Different studies have verified the mediating effect of satisfaction in sustainable tourism settings. Nguyen et al. (2025), for example, showed that satisfaction is a significant determinant of sustaining behavior and acts as an important mechanism through which appealing destinations and ecologic consciousness implement their impacts. Likewise, Sarangi and Ghosh (2025) verified that satisfaction mediates among reliability, service quality, destination image, and tourist loyalty in the Sundarbans. These results also emerge in Rohman (2020), wherein perceived value and tourist loyalty were mediated by perceived quality of life and satisfaction, and the strength of affective experiences to transform. While these studies offer strong evidence for satisfaction as a mediating variable, all are based on cross-sectional data, which constrain causality.

Adding to the complexity is that some authors described the normative aspect as being at the center of sustainable behavior change. Javed et al. (2025) spoke of the mediating function served by Personal Norms between social norms (injunctive and descriptive) and tourist pro-environmental intentions, with Personal Norms described as internalized obligations relying on society and moral social cues. Likewise, Saltik and Akova (2024) demonstrated how subjective norms bridged the gap between the perceived environment and behavior, verifying the hypothesis that internalized expectations are crucial. This is anchored on value-belief-norm (VBN) theory, suggesting that Personal Norms represent the ultimate psychological step prior to behavioral commitment.

Emotional experiences and destination image have also been incorporated into this mediation model in recent studies. He et al. (2024) demonstrated that emotional experiences, moderated by service interaction and destination image, directly impact satisfaction and also behaviors such as word-of-mouth and revisit intention. This is also evidenced by Jiang et al. (2018), where, when considering technologically enhanced tourism employing augmented reality, they discovered that memorable tourism experiences (MTEs) act as a mediator between attitudes and perceptions towards technology and behavioral intentions. It would therefore appear from this that affective resonance, be it natural soundscapes (Jiang et al., 2018) or immersive technology, has the potential to evoke long-term behavioral commitments typically by way of satisfaction and attitude shifts.

Nonetheless, there exist significant nuances and contradictions. For example, Oviedo-García et al. (2017) established that attitudes and perceived site value mediate the effect of ecotourism knowledge on satisfaction, where cognitive judgments may also be predictors of satisfaction, which in turn induces loyalty or behavior. Yet, a few research works advise that satisfaction with social media marketing is not necessarily followed by behavioral intentions unless accompanied by attitudinal or value congruence, supporting the importance of multi-layered models of mediation (Hansen et al., 2024).

One of the most important gaps in recent studies is the underdevelopment of the crossroads of aesthetic and spiritual aspects of experience—now widely acknowledged as being highly potent affective building blocks—of satisfaction and norms to produce behavior outcomes. While Cheng and Wu (2015) and Mousazadeh et al. (2023) mention the significance of place attachment and collective meaning-making, the available models of the affective-experiential aspects within a broader mediation model that includes Satisfaction and Personal Norms are very limited.

Filling this gap, the current research suggests a dual mediation model in which tourist happiness and personal norms are successive mediators among experiential measures—i.e., environmental concern, quality perception of the trip, and aesthetic/spiritual experience—and sustainable behaviors after the visit (Rohman, 2020; Saltik & Akova, 2024; Sarangi & Ghosh, 2025). This integrative model not only includes affective, cognitive, and normative routes but also reconciles opposing results in the literature within an explanatory model. In doing so, it provides further insight into the psychological processes by which such a widely quoted ecotourism intention–behavior gap can be overcome.

Grounded in the foregoing empirical evidence and theoretical underpinnings, this research integrates the emotional, cognitive, and normative processes that connect ecotourism experience with sustainable behavior consequences. By placing Tourist Satisfaction and Personal Norms as central mediators, we formulate an encompassing structural model that illustrates the dynamic interaction between experiential predictors and post-visit behavior. To this end, the following hypotheses were examined for mediation paths:

H5a. *The relationship between Environmental Concern (EC) and Responsible Post-Visit Behavior (RPB) is mediated by Tourist Satisfaction (SAT).*

H5b. *The relationship between Environmental Concern (EC) and Responsible Post-Visit Behavior (RPB) is mediated by Personal Norms (PN).*

H6a. *The relationship between Perceived Trip Quality (PTQ) and Responsible Post-Visit Behavior (RPB) is mediated by Tourist Satisfaction (SAT).*

H6b. *The relationship between Perceived Trip Quality (PTQ) and Responsible Post-Visit Behavior (RPB) is mediated by Personal Norms (PN).*

H7a. *The relationship between Aesthetic/Spiritual Experience (ASE) and Responsible Post-Visit Behavior (RPB) is mediated by Tourist Satisfaction (SAT).*

H7b. *The relationship between Aesthetic/Spiritual Experience (ASE) and Responsible Post-Visit Behavior (RPB) is mediated by Personal Norms (PN).*

3. Research Methodology

3.1. Conceptual Model and Rationale

The proposed conceptual model (Figure 1) examines the behavioral impacts of ecotourism experiences in an analysis of the effects of Environmental Concern, Perceived Trip Quality, and Aesthetic/Spiritual Experience on responsible post-visit behavior. The model builds on core theoretical stances such as the value–belief–norm (VBN) theory, the experience–satisfaction–behavior chain, and psychological models of pro-environmental behavior (Alashiq & Aljuhmani, 2025; T. H. Le et al., 2021; Stern et al., 1999). The model incorporates cognitive, affective, and normative elements in an effort to describe how tourism experiences form sustainable behavioral intentions post-trip.

This framework revolves around the Responsible Post-Visit Behavior (RPB) construct that encompasses tourists' propensity to engage in environmentally friendly actions, provide support to local initiatives, and promote environmentally friendly practices at home. Past research has highlighted ecotourism as not only an experience of site, but as a means to elicit long-term behavior change (Cheng & Wu, 2015; Y. H. Lin & Lee, 2020).

Environmental Concern (EC) measures tourists' overall sensitivity and awareness of environmental problems and has always been associated with sustainability-minded intentions (Dunlap et al., 2000; Javed et al., 2025). According to the VBN theory, EC is

anticipated to have a direct impact on satisfaction and personal norm formation because ecologically concerned tourists are likely to judge their experience from an ecological perspective, converting concern into moral responsibility and satisfaction (Ribeiro et al., 2025). Therefore, EC is anticipated to impact RPB indirectly through such mediators.

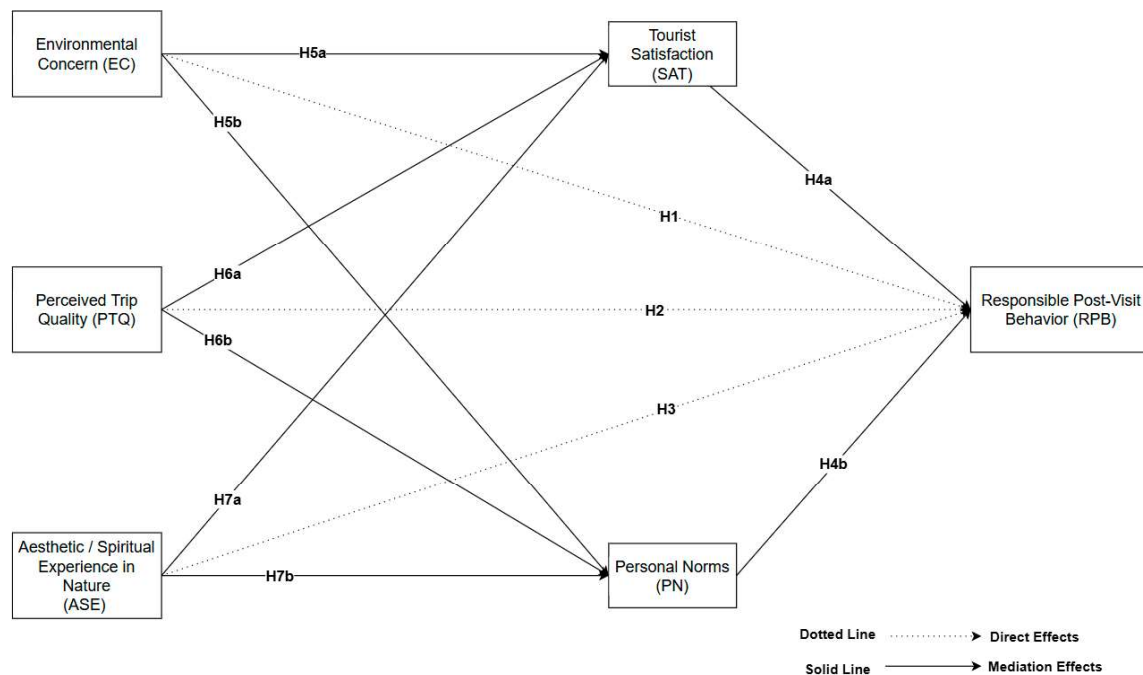


Figure 1. Conceptual model.

Perceived Trip Quality (PTQ) reflects the cognitive assessments of the tourist destination and tourism service with attributes like infrastructure, management, and locals' participation. Good ecotourism experiences create satisfaction and internalization of sustainability norms among tourists for whom trip quality is consistent with the tourists' environmental values; otherwise, PTQ must impact responsible consumption behavior (RPB) directly and indirectly through satisfaction and personal norms (Y. H. Lin & Lee, 2020; Nguyen et al., 2025; Oviedo-García et al., 2017).

Aesthetic and Spiritual Experience (ASE) includes transient, awe-filled episodes of subjective vastness and “small-self” evaluation that shift attention from self-interest to wider, biospheric and prosocial interests (Jiang et al., 2018). Modern research on awe reports such states to enhance humility, moral care, and cooperative orientations with trickle-down influences on generosity and collective orientation. Within environmental psychology, ASE is hypothesized to exert its influence through nature connectedness—the self-report of oneness with nature—arguably a cross-culturally generalizable and research-supported predictor of environmentally sustainable behavior. Within the VBN/NAM framework, ASE would enhance awareness of consequences (AC) and ascription of responsibility (AR) and thereby engage personal norms (PN) for environmentally sustainable action (Cheng & Wu, 2015). Small-self judgment decreases egoic worry, making loss to the environment more morally significant (increasing AC) and increasing felt obligation to act (increasing AR), both of which collectively increase PN. ASE should also prime feasibility judgments when awe is presented with efficacy cues (e.g., visible low-effort alternatives), thus increasing TPB by indirectly increasing PBC in leisure contexts where convenience restrictions are prominent. Together, ASE constitutes an affective pathway connecting to VBN/NAM (through AC → AR → PN) and TPB (through connectedness-facilitated efficacy), explaining how fleeting emotional moments within winter contexts might turn into sustained

pro-environmental behavior (Cheng & Wu, 2015). ASE has the potential to contribute to the place attachment and moral obligation of tourists, promoting Personal Norms (PN) development that acts to responsible conduct (Jiang et al., 2018). ASE is therefore expected to indirectly influence RPB through enhanced satisfaction and personal moral obligation.

Tourist Satisfaction (SAT) serves a dual function in this model both as a result of the three antecedent constructs and as an antecedent to behavioral intentions. Based on satisfaction–loyalty theory and experience economy work (Gánem-Gutiérrez & Gilmore, 2023; Nguyen et al., 2025), tourists are more likely to have positive supportive post-visit behavior such as advocacy and repeat visits if they are more satisfied. SAT is therefore assumed to be a central mediator that consolidates the affective assessment of the ecotourism experience.

Personal Norms (PN) are internalized moral norms for behaving in ecologically responsible manners, based on cognitive evaluations (e.g., trip quality, concern) and affective reactions (ASE) (Saltik & Akova, 2024). PN is incorporated as a second mediation process between the ecotourism experience and long-term behavior change. This prescriptive path is complemented by growing evidence that it is moral commitment, and not just satisfaction, that drives behavioral persistence beyond the tourism context (Hansen et al., 2024; Javed et al., 2025). RPB was operationalized in terms of post-visit behavior frequency (and not intention), and respondents were asked how often, since the ecotourism visit, they had been practicing behaviors including (a) donations or voluntary work for conservation, (b) low-impact consumption behaviors (e.g., sustainable products, less use of single-use plastics), and (c) low-carbon travel behaviors (e.g., public transport). A three-item reflective scale is in accordance with the PLS-SEM convention for constructs having clear definitions and may provide reliable, valid measures where internal consistency and convergent validity are established (e.g., CR, AVE, and loadings at standard cut-offs). We point out that the items referred explicitly to past behavior across a first-time window in order to prevent blurring with intentions. Content validity was likewise ensured by piloting with an expert review, and the scale showed sufficient reliability and convergent validity for our model. We recognize that future studies can triangulate against objective/trace behaviors and widen the item pool to further enhance validity.

By examining cognitive, affective, and normative processes together, this model builds upon existing studies through the inclusion of several mediators in one theory. The model adds to the theory because it aligns destination experience constructs with environmental psychology constructs to further detail how ecotourism involvement is converted into post-trip behavior alteration. In practice, the results are expected to inform destination managers, policymakers, and environmental educators on how to design impactful ecotourism experiences that will result in long-term sustainability participation.

3.2. Data Collection and Sampling

This research adopted a quantitative cross-sectional research design as found appropriate to test the hypothesized interconnections between psychological and experiential determinants of responsible post-visit behavior in ecotourism (Kesmodel, 2018; Olsen & St George, 2004). Theoretical guidance from the value–belief–norm (VBN) theory and Experience Economy framework, the structural model confirms the degree to which Environmental Concern (EC), Perceived Trip Quality (PTQ), and Aesthetic/Spiritual Experience (ASE) can forecast Responsible Post-Visit Behavior (RPB) with Satisfaction (SAT) and Personal Norms (PN) as mediating constructs. A cross-sectional design was considered suitable, as it allows data to be gathered effectively at one point in time from a population that has participated in ecotourism activities in the recent past (Olsen & St George, 2004; Rahman, 2023).

A purposive sampling method was used so that the participants would have met some inclusion criteria: (1) over the age of 18, (2) who had taken at least one nature-based ecotourism experience (e.g., national park visits, eco-lodges, culture-nature tours with guides) in the past six months, and (3) were able to recall and think cognitively about their trip experience so that they would have sufficient exposure to the constructs being measured. Excluded were respondents who (a) participated in regular mass tourism packages with no clearly eco-based or nature-oriented component, i.e., regular beach vacations or sightseeing in cities with no environmental orientation, or (b) finished their ecotourism activity more than six months earlier, as long time prospects tend to distort recall accuracy and reduce self-reported affective and behavioral response validity. This non-probability method was employed because it was most suited to sampling an experiential context population that was suitable, especially with the emphasis on post-trip cognitive, emotional, and behavioral variables of the study (Robinson, 2023; Suen et al., 2014; Tongco, 2007).

We collected information using a standardized online survey form (Google Forms). To ensure maximum reach and minimize single-channel bias, we promoted the invite via (1) co-operating ecotourism operator e-mail lists/newsletters (opt-in subscribers only); (2) QR codes posted at eco-lodges, visitor centers, and guide offices; (3) posting messages on sustainability and nature-travel forums (e.g., special “responsible travel” groups) subject to approval of moderators; and (4) university eco-clubs and outdoor clubs. The questionnaire remained open for three months (January to March 2025) and with two reminders with a time gap of ~3–4 weeks. The landing page had eligibility criteria, study aims, and the informed consent statement; only adults agreeing were allowed to proceed to the questionnaire (Naderifar et al., 2017; Noy, 2008). Across the three-month field period, the QR/link to the survey was viewed 3480 times individually, 1096 started the questionnaire, 892 were eligible and consented, and 585 returned full, analyzable responses on quality checks (attention/straight-lining/time filters). This represents a 31.5% start rate compared to views, an 81.4% eligibility/consent rate out of starts, a 53.4% completion rate out of all starts, and a 65.6% completion rate out of eligible starts (585/892).

The instrument for measurement was constructed by adapting items drawn from previously validated scales on environmental concern, satisfaction, tourist experience quality, and pro-environmental norms and behaviors. The 24 Likert-style items were rated on a five-point scale that ranged from 1 (strongly disagree) to 5 (strongly agree) and included three sections: demographic data, trip data, and construct-related items. The pilot test was administered on a small sample size ($n = 20$) of ecotourism participants to verify clarity, cultural appropriateness, and face validity. Minor word adjustments were made based on pilot feedback (Appendix A, Table A1). To reduce common-method and self-presentation biases, we applied ex-ante remedies: anonymous response; neutral, non-judgmental language; randomized block design of items; proximal separation of predictors, mediators, and outcomes; and attention-check items. The consent page where we got the consent highlighted the fact that there were no right/wrong answers and answers would be analyzed as an aggregate. Whereas cross-sectional single-source data are widespread in tourism studies, we observe post hoc tests (like Harman’s single-factor) to be constrained; however, follow-up studies are invited to complement such processes with marker-variable or latent-method-factor approaches and objective/trace behavioral measures. Given the Greece-based sampling frame, external validity is discussed in the Limitations section, with a call for cross-cultural replication (see the Limitations and Future Directions section).

Sample size was determined based on structural equation modeling guidelines, which recommend a ratio of estimated parameters per participant of 10 or more (Memon et al., 2020; Wagner & Grimm, 2023). With six latent constructs and about 24 observed items, a minimum of 300 participants were aimed at in order to ensure proper model stability and

power. This sample size also allows for subgroup analysis, if necessary, by age group, type of trip, or prior ecotourism experience. Participants were made aware of the voluntary nature of the research, confidentiality in answering questions, and a right to withdraw at any time. Informed consent was initially sought before participant involvement, and no identifiable information was gathered. Before analysis, we imposed conservative quality filters: exclusion of duplicate IP/device records, high rates of item nonresponse, straight-lining/long-string patterns, and implausible short completion times (<one-third median). We screened multivariate outliers using influence diagnostics well-suited to variance-based SEM and checked descriptive distributions for each construct. We modeled only complete, eligible cases.

3.3. Measurement Instruments

All study constructs were quantified using multi-item scales derived from previous measures in tourism studies and environmental psychology. Environmental concern (EC) was measured with five items based on [Dunlap et al. \(2000\)](#) and [Zammitti et al. \(2023\)](#), which evaluate the awareness, concern, and feeling of responsibility of the participants for environmental problems. Perceived Trip Quality (PTQ) was assessed through four items adapted from [Martínez-Roget et al. \(2020\)](#) and [C.-F. Chen and Tsai \(2007\)](#), expressing evaluations of the organization, emotional engagement, and general experience of the trip. Aesthetic/Spiritual Experience (ASE) consisted of four items adapted from [Coghlan et al. \(2012\)](#) and [Lu et al. \(2017\)](#), expressing emotional and transcendent responses to nature. Tourist Satisfaction (SAT) was measured with three items from [T. T. T. Thuy et al. \(2025\)](#) recording general satisfaction and expectation fulfillment. Personal Norms (PN) were measured with three items from [Stern et al. \(1999\)](#) measuring internalized moral obligation to be pro-environmental. Responsible Post-Visit Behavior (RPB) was measured with one item from [Dias et al. \(2021\)](#) recording behavior change following the ecotourism experience. All items were scored on a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). For reflective measurement evaluation, we adhered to standard PLS-SEM guidelines to maintain indicators with high outer loadings and eliminate those that compromised convergent validity. Two items, ASE5 and PTQ5, had outer loadings < 0.50 and were eliminated. Indicators retained represent the same conceptual domains, and all constructs equaled or surpassed the suggested standards for composite reliability and AVE, with minimal improvements with elimination. Discriminant validity (HTMT, Fornell-Larcker) continued to be adequate.

3.4. Sample Profile

To this end, 585 valid responses were gathered for this research (Table 1). The population comprised 52.1% females (n = 305) and 47.9% males (n = 280). The participants' age ranged from 18 to over 55 years, with the largest proportion being between 35 and 44 (29.2%), followed by 25–34 (21.4%), 18–24 (20.0%), 55 and over (18.6%), and 45–54 (10.8%). At the level of educational attainments, 32.3% had a bachelor's degree, 29.7% had a master's degree, 21.7% had a high school diploma or equivalent, 10.8% had a doctorate or higher degree, and 5.5% were PhD candidates during the study. In terms of experience, 64.3% indicated that this was their first ecotourism experience, and 35.7% indicated that they had already done so before. In terms of how many ecotourism or nature-based vacations they had taken over the last three years, 38.1% indicated that they had taken one trip, 26.0% indicated two to three trips, 23.6% indicated four to five trips, and 12.3% indicated that they had taken more than five. The latest ecotourism activity of the participants was wildlife watching (29.2%), conservation or volunteer-based tourism (18.5%), visits to a national park or protected area (17.6%), overnight in an eco-lodge or green-rated accommodation

(17.9%), and other nature-related activities (16.8%). Finally, in line with the question about their environmental orientation before the trip, most (58.3%) explained that they had some consciousness or offhand concern. 27.2% had little interest in or involvement with environmental concerns, while 14.5% explained that they were already actively concerned about environmental issues.

Table 1. Sample profile.

		Frequency	Percentage
Gender	Male	280	47.9%
	Female	305	52.1%
Age	18–24	117	20.0%
	25–34	125	21.4%
	35–44	171	29.2%
	45–54	63	10.8%
	55+	109	18.6%
Study Levels	High school diploma or equivalent	127	21.7%
	Bachelor’s degree	189	32.3%
	Master’s degree	174	29.7%
	PhD candidate	32	5.5%
	Doctorate or higher	63	10.8%
Was this your first ecotourism experience?	No	209	35.7%
	Yes	376	64.3%
How many ecotourism or nature-based trips have you taken in the past 3 years?	1 trip	223	38.1%
	2–3 trips	152	26.0%
	4–5 trips	138	23.6%
	More than 5 trips	72	12.3%
What type of ecotourism experience did you most recently participate in?	Visit to a national park or protected area	103	17.6%
	Stay at an eco-lodge or green-certified accommodation	105	17.9%
	Wildlife observation (e.g., birdwatching, safaris)	171	29.2%
	Volunteering or conservation-based tourism	108	18.5%
	Other	98	16.8%
How would you describe your environmental orientation before the trip?	I had little interest or involvement in environmental issues	159	27.2%
	I had some awareness or casual concern	341	58.3%
	I was already actively concerned and involved	85	14.5%

4. Data Analysis and Results

The present model analysis was done based on the Structural Equation Modeling (SEM) strategy employed in SmartPLS 4 (Version 4.1.1.4). Following [Nitzl et al. \(2016\)](#), SEM—specifically its variance-based variant—is widely considered a legitimate research approach for the social science and management disciplines. Partial least squares SEM (PLS-SEM) was applied since it is able to estimate cause-effect relationships and maximize variance explained in endogenous latent variables ([Hair et al., 2006, 2011](#)). Multi-group analysis (MGA) was used to examine subgroup-specific effects, providing contextual differences that may be masked under typical regression approaches ([Cheah et al., 2023](#)). The estimation process followed the guidelines suggested by [Wong \(2013\)](#), to properly calculate path coefficients, standard errors, and reliability measures. According to the standards laid down for reflective measurement models, indicator reliability was assessed using outer loadings of more than 0.70 as good enough.

4.1. Common Method Bias (CMB) and Collinearity Diagnostics

In order to check the validity and reliability of the results, systematic measurement for common method bias (CMB) was conducted as per procedural guidance laid out by Podsakoff et al. (2003). Harman's single-factor test was conducted to check if one latent factor explained most of the variance structure. The unrotated principal component analysis revealed that the most dominant factor explained 32.544% of the variance, far from the recommended cut-off of 50%. Although CMB was not critical in the current study, its control increases validity for associations among variables and stability of results by reducing potential measurement biases (Podsakoff et al., 2003, 2012). Furthermore, we examined collinearity diagnostics. While our indicators are reflective, we report outer VIFs as a redundancy check; all were <3.10 (Table 2). More critically, inner (structural) VIFs for all sets of predictors ranged from 1.007 to 2.186, well within traditional cut-offs (preferred <3.3; acceptable <5), suggesting that multicollinearity will not spuriously inflate structural paths. Collectively, these statistical and procedural controls ensure that collinearity and CMB will not distort the reported relationships.

Table 2. Collinearity diagnostics (outer indicators and inner/structural paths).

Panel A. Indicator (Outer) VIF	VIF	Panel B. Inner/Structural VIF (Predictor → Criterion)	VIF
ASE1	3.090	ASE → PN	1.617
ASE2	2.552	ASE → RPB	2.186
ASE3	1.657	ASE → SAT	1.617
ASE4	1.178	EC → PN	1.007
EC1	1.711	EC → RPB	1.092
EC2	1.921	EC → SAT	1.007
EC3	1.707	PN → RPB	1.564
EC4	1.918	PTQ → PN	1.617
EC5	1.920	PTQ → RPB	1.785
PN1	2.383	PTQ → SAT	1.617
PN2	2.250	SAT → RPB	1.660
PN3	2.249		
PTQ1	1.510		
PTQ2	1.820		
PTQ3	1.795		
PTQ4	1.657		
RPB1	1.330		
RPB2	2.145		
RPB3	2.163		
SAT1	1.286		
SAT2	1.286		
SAT3	1.292		

Note: For reflective indicators, outer VIFs are reported as a redundancy diagnostic; collinearity relevant for path estimation is summarized by inner (structural) VIFs. Conventional thresholds: preferred <3.3; acceptable <5.

4.2. Measurement Model

The first step of the PLS-SEM process is the rigorous test of the measurement model, whereby all the constructs are gauged through reflective indicators. Hair et al. (2006) state that this testing encompasses some of the most important metrics such as composite reliability, indicator reliability, convergent validity, and discriminant validity. As observed by Vinzi et al. (2010), indicator reliability is an approximation of the ratio of variance of a measured variable accounted for by its underlying construct and is evaluated in terms of magnitudes of outer loadings. As per the guidelines of Wong (2013) as well as Chin (2009), loadings greater than 0.70 are viewed to be satisfactory. Nevertheless, within social science research, Vinzi et al. (2010) observe that there may be cases where

indicators fall below this. This removal would be guided by an assessment of their effect on composite reliability and convergent validity to avoid premature deletion. [Hair et al. \(2011\)](#) recommend that indicators with 0.40 to 0.70 loading should only be deleted if it significantly improves composite reliability or AVE. According to [Gefen et al. \(2003\)](#) guidelines, PTQ5 and ASE5 were eliminated from the analysis since they recorded less than 0.50 factor loadings, as shown in Table 3. The two of them—PTQ5 and ASE5—consistently produced low outer loadings (<0.50) and poor item–construct relations across iterations and were thus eliminated. Removing them strengthened the AVE and composite reliability for PTQ and ASE without harming discriminant validity (HTMT < 0.85; Fornell–Larcker continued to be met). We re-estimated the model on validity checks with both items; there was no change in the significant pattern of paths or in all hypothesis decisions. For transparency, see the entire cross-loading matrix in Appendix A, Table A2.

Table 3. Factor loading reliability and convergent validity.

Constructs	Items	Factor Loadings	Cronbach's Alpha	rho_A	CR	AVE
Aesthetic/Spiritual Experience in Nature	ASE1	0.886	0.907	0.909	0.935	0.783
	ASE2	0.826				
	ASE3	0.918				
	ASE4	0.906				
Environmental Concern	EC1	0.827	0.827	0.853	0.870	0.575
	EC2	0.807				
	EC3	0.798				
	EC4	0.645				
	EC5	0.697				
Personal Norms	PN1	0.891	0.870	0.871	0.920	0.793
	PN2	0.893				
	PN3	0.887				
Perceived Trip Quality	PTQ1	0.759	0.803	0.805	0.872	0.629
	PTQ2	0.817				
	PTQ3	0.794				
	PTQ4	0.802				
Responsible Post-Visit Behavior	RPB1	0.720	0.783	0.827	0.874	0.699
	RPB2	0.903				
	RPB3	0.874				
Tourist Satisfaction	SAT1	0.725	0.662	0.722	0.810	0.588
	SAT2	0.855				
	SAT3	0.713				

Note: The table presents the outer factor loadings of each item on its associated latent construct, as well as the internal consistency indicators: Cronbach's alpha, rho_A, composite reliability (CR), and average variance extracted (AVE).

The reliability assessment in this study used Cronbach's alpha, rho_A, and composite reliability as the major measures. In accordance with the cut-off point by [Wasko and Faraj \(2005\)](#), values above 0.700 were noted for items like Environmental Concern (EC), Perceived Trip Quality (PTQ), Aesthetic/Spiritual Experience (ASE), Tourist Satisfaction (SAT), Personal Norms (PN), and Responsible Post-Visit Behavior (RPB). For the remaining scales, reliability varied between moderate and high, similar to prior empirical results. The rho_A coefficient, theoretically intermediate between Cronbach's alpha and composite reliability, also exceeded 0.70 in all but two instances, consistent with [Sarstedt et al. \(2021\)](#) reliability results and [Henseler et al. \(2015\)](#).

Convergent validity was attained since the average variance extracted (AVE) values for the majority of the constructs exceeded the 0.50 mark advocated by [Fornell and Larcker \(1981\)](#). Where the AVE was marginally less than this, the composite reliability was still in

excess of 0.60, which was the acceptable limit for convergent validity according to the same authors. Discriminant validity was examined via inter-construct correlation analysis, where the square root of the AVE of every construct was greater than its correlations with the other constructs—a method based on the [Fornell and Larcker \(1981\)](#). These findings were also validated using the heterotrait–monotrait (HTMT) ratio of correlations, as suggested by [Henseler et al. \(2015\)](#), where all HTMT values were below the conservative threshold of 0.85, as presented in Tables 4 and 5.

Table 4. HTMT ratio.

	ASE	EC	PN	PTQ	RPB	SAT
ASE						
EC	0.100					
PN	0.626	0.221				
PTQ	0.724	0.121	0.512			
RPB	0.623	0.064	0.607	0.722		
SAT	0.726	0.191	0.510	0.667	0.607	

Note: This table shows the HTMT ratios between each pair of latent constructs. HTMT values below the threshold of 0.85 indicate acceptable discriminant validity. All values in this analysis meet this requirement, confirming that each construct is empirically distinct.

Table 5. Fornell and Larcker criterion.

	ASE	EC	PN	PTQ	RPB	SAT
ASE	0.885					
EC	−0.033	0.758				
PN	0.555	−0.209	0.891			
PTQ	0.615	0.039	0.429	0.793		
RPB	0.532	−0.001	0.504	0.588	0.836	
SAT	0.580	−0.127	0.388	0.525	0.482	0.767

Note: The diagonal values (in bold) represent the square roots of the AVE for each construct, which should be greater than the inter-construct correlations in the corresponding rows and columns. This condition is met across all constructs, supporting discriminant validity in the measurement model.

4.3. Structural Model

The structural model was assessed based on the coefficient of determination (R^2), predictive relevance (Q^2), and statistical significance of the path coefficients, according to [Hair et al.'s \(2011\)](#) criteria. In the current study, the R^2 values were 0.454 for Responsible Post-Visit Behavior (RPB), 0.360 for Personal Norms (PN), and 0.397 for Tourist Satisfaction (SAT), indicating moderate explanatory power within the desirable range of 0 to 1. The Q^2 values that measure the predictability of the model by the blindfolding procedure also indicated good results: 0.385 for RPB, 0.352 for PN, and 0.388 for SAT, indicating moderate to high predictive power.

To verify the model to an even greater extent, hypothesis testing was employed for estimating structural relations among the latent variables and for testing their significance. Path coefficients were estimated with the nonparametric bootstrapping procedure, according to [Sarstedt et al.'s \(2021\)](#) recommendation. Mediation effects were tested based on a one-tailed, bias-corrected bootstrapping procedure for 10,000 resamples, following [Preacher and Hayes' \(2008\)](#) and [Streukens and Leroi-Werelds' \(2016\)](#) recommendation. To determine the direct associations among the predictor and outcome variables in the hypothesized model, partial least squares structural equation modeling (PLS-SEM) path analysis was performed. Standardized path coefficients (β), standard errors, t-values, and significance levels (p -values) were estimated by 10,000-sample bias-corrected bootstrapping (Table 6).

Table 6. Hypotheses testing.

Hypothesis	Path	Coefficient (β)	SD	t-Value	p-Value	Results
H1	EC \rightarrow RPB	0.065	0.031	2.056	0.020	Supported
H2	PTQ \rightarrow RPB	0.333	0.039	8.618	0.000	Supported
H3	ASE \rightarrow RPB	0.090	0.052	1.739	0.041	Supported
H4a	SAT \rightarrow RPB	0.162	0.039	4.190	0.000	Supported
H4b	PN \rightarrow RPB	0.262	0.042	6.267	0.000	Supported

As Table 6 shows, all the hypothesized direct effects were statistically significant and supported. Environmental Concern (EC) had a weak but positive impact on RPB ($\beta = 0.065$, $t = 2.056$, $p = 0.020$), and this provided evidence for H1. Perceived Trip Quality (PTQ) was the most significant predictor of the exogenous variables, and it had a significant and strong impact on RPB positively ($\beta = 0.333$, $t = 8.618$, $p < 0.001$), lending support to H2. Aesthetic/Spiritual Experience (ASE) also had a direct significant impact on RPB ($\beta = 0.090$, $t = 1.739$, $p = 0.041$), lending support to H3. With regard to the mediating constructs, SAT was highly correlated and significantly related to RPB ($\beta = 0.162$, $t = 4.190$, $p < 0.001$), confirming H4a. Likewise, PN was highly and significantly related to RPB ($\beta = 0.262$, $t = 6.267$, $p < 0.001$), confirming H4b.

These findings underscore the multi-determined and multifaceted character of responsible behavior formation in response to ecotourism participation, showing how such behavior is not merely shaped by the content or excellence of the experience itself, but through an interactive process involving reflective judgment, affective response, and strongly internalized moral duty. Specifically, cognitive-emotional assessments—i.e., tourists' aesthetic engagement and satisfaction—and normative beliefs—assessed through personal moral norms activation—are equally responsible for post-trip intentions to behave in an eco-friendly way. In other words, meaningful, reflective, and emotionally evocative ecotourism experiences are capable of activating inner value systems and promoting a stronger commitment to environmentally sound actions during the after-trip phase. A visual illustration of the results is depicted in Figure 2.

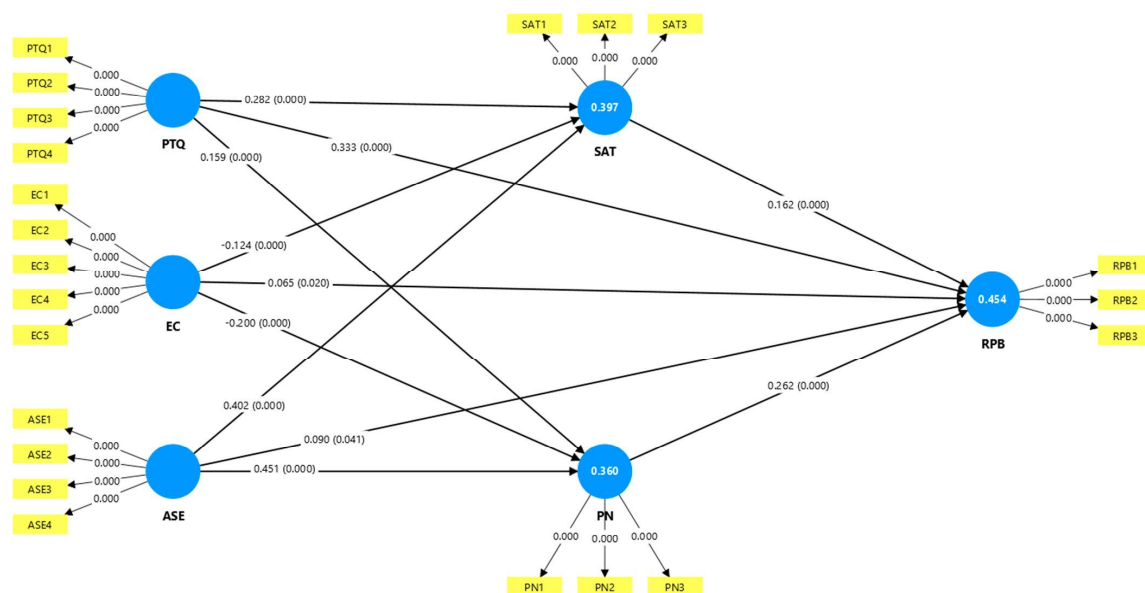


Figure 2. PLS-SEM results for the extended VBN/experience model. Values on the arrows are standardized path coefficients (β) with bootstrapped two-tailed p -values in parentheses (10,000 samples). Blue nodes display R^2 for endogenous constructs. Yellow boxes are reflective indicators; outer loadings are shown (all $p < 0.001$ unless otherwise noted).

4.4. Mediation Analysis

To measure the mediating roles of Tourist Satisfaction (SAT) and Personal Norms (PN) between exogenous variables and Responsible Post-Visit Behavior (RPB), a bootstrapping test with resamples of 10,000 was utilized. Table 7 displays the direct effects as well as the total effects.

Table 7. Mediation analysis.

Hypothesis	Direct Effects	Coeff. (β)	SD	t-Value	p-Value	Results	Mediation Type
	EC \rightarrow RPB	0.065	0.031	2.056	0.020		
	PTQ \rightarrow RPB	0.333	0.039	8.618	0.000		
	ASE \rightarrow RPB	0.090	0.052	1.739	0.041		
	Total Effects	Coeff. (β)	SD	t-Value	p-Value		
	ASE \rightarrow RPB	0.183	0.031	5.945	0.000		
	EC \rightarrow RPB	−0.072	0.015	4.745	0.000		
	PTQ \rightarrow RPB	0.087	0.019	4.667	0.000		
	Specific Indirect Effects	Coeff. (β)	SD	t-Value	p-Value		
H5a	EC \rightarrow SAT \rightarrow RPB	0.020	0.006	3.129	0.001	Supp.	Partial Mediation
H5b	EC \rightarrow PN \rightarrow RPB	0.052	0.014	3.841	0.000	Supp.	Partial Mediation
H6a	PTQ \rightarrow SAT \rightarrow RPB	0.046	0.014	3.268	0.001	Supp.	Partial Mediation
H6b	PTQ \rightarrow PN \rightarrow RPB	0.042	0.012	3.358	0.000	Supp.	Partial Mediation
H7a	ASE \rightarrow SAT \rightarrow RPB	0.065	0.017	3.792	0.000	Supp.	Partial Mediation
H7b	ASE \rightarrow PN \rightarrow RPB	0.118	0.023	5.075	0.000	Supp.	Partial Mediation

There were also significant mediation effects for each of the hypothesized pathways. That is, Environmental Concern (EC) significantly indirectly affected RPB through both SAT ($\beta = 0.020$, $t = 3.129$, $p = 0.001$) and PN ($\beta = 0.052$, $t = 3.841$, $p < 0.001$), thus supporting Hypotheses H5a and H5b. Interestingly, however, the direct impact from EC to RPB was still statistically significant ($\beta = 0.065$, $t = 2.056$, $p = 0.020$), which means that there was partial mediation. This indicates that EC affects RPB directly as well as indirectly through the mediating mechanisms of satisfaction and internalized norms. In the same vein, Perceived Trip Quality (PTQ) had its influences through SAT ($\beta = 0.046$, $t = 3.268$, $p = 0.001$) and PN ($\beta = 0.042$, $t = 3.358$, $p < 0.001$), and a significant and strong direct influence was also found ($\beta = 0.333$, $t = 8.618$, $p < 0.001$), pointing towards partial mediation. Hypotheses H6a and H6b were confirmed. Aesthetic/Spiritual Experience (ASE) also had an indirect influence on RPB via SAT ($\beta = 0.065$, $t = 3.792$, $p < 0.001$) and PN ($\beta = 0.118$, $t = 5.075$, $p < 0.001$), confirming Hypotheses H7a and H7b. The direct impact from ASE to RPB was still significant ($\beta = 0.090$, $t = 1.739$, $p = 0.041$), ascertaining partial mediation in this instance as well.

Together, these findings establish that both mediators, Tourist Satisfaction and Personal Norms, are significant to account for the way antecedent factors affect responsible behavioral intentions following ecotourism experiences. Yet, the residual effect of the direct paths indicates that these effects are not solely mediated, but rather partially directed through cognitive-affective and normative ones.

4.5. Multi-Group (MGA) Analysis

Group differences in path coefficients were also tested with SmartPLS based on the bootstrap MGA procedure, 10,000 subsamples, BCa bootstrap confidence intervals, fixed seed, and parallel processing. In line with Hair et al. (2011), we report $\Delta\beta = \beta_{\text{GroupA}} - \beta_{\text{GroupB}}$ and the SmartPLS one-tailed BCa p -value, testing whether the estimated direction of $\Delta\beta$ is not equal to zero. The sign of $\Delta\beta$ indicates the stronger group for the

corresponding path. Measurement invariance was established prior to MGA, and only theoretically supported paths were compared. In order to determine if the structural relationships differed between demographic and experiential subgroups, a set of multi-group analyses (MGA) was performed using the PLS-MGA method with a significance criterion of $p < 0.05$ (Table 8).

Table 8. Significant MGA results with group comparisons.

Path	Group Comparison	Difference ($\Delta\beta$)	<i>p</i> -Value
ASE → RPB	Male vs. Female	0.364	0.000
SAT → RPB	Male vs. Female	−0.342	0.000
PTQ → RPB	Male vs. Female	0.231	0.002
PTQ → PN	Male vs. Female	0.213	0.006
EC → SAT	Male vs. Female	−0.168	0.012
EC → RPB	Male vs. Female	−0.159	0.013
ASE → SAT	18–24 vs. 25–34	0.421	0.003
	25–34 vs. 35–44	−0.332	0.002
PTQ → SAT	18–24 vs. 25–34	−0.403	0.003
	25–34 vs. 35–44	0.415	0.000
SAT → RPB	18–24 vs. 25–34	0.333	0.003
	25–34 vs. 35–44	−0.435	0.000
ASE → RPB	18–24 vs. 25–34	−0.331	0.011
	25–34 vs. 35–44	0.492	0.000
	25–34 vs. 45–54	0.609	0.002
PTQ → PN	18–24 vs. 25–34	0.282	0.033
	18–24 vs. 45–54	0.365	0.025
EC → PN	18–24 vs. 35–44	0.243	0.024
	18–24 vs. 45–54	0.477	0.002
	35–44 vs. 45–54	0.234	0.019
EC → SAT	Bachelor's vs. Doctorate or higher	0.419	0.010
EC → SAT	Bachelor's vs. High school	0.258	0.009
EC → SAT	Bachelor's vs. Master's degree	0.228	0.012
PN → RPB	Bachelor's vs. Doctorate or higher	0.213	0.044
PN → RPB	Bachelor's vs. High school	0.203	0.031
PN → RPB	Bachelor's vs. PhD Candidate	0.541	0.023
EC → PN	Bachelor's vs. High school	0.314	0.004
EC → PN	Doctorate or higher vs. Master's degree	−0.318	0.043
ASE → PN	Bachelor's vs. High school	0.283	0.005
ASE → RPB	Bachelor's vs. PhD Candidate	−0.475	0.050
PTQ → RPB	Doctorate or higher vs. PhD Candidate	0.491	0.031
PTQ → RPB	High school vs. PhD Candidate	0.526	0.014
PTQ → RPB	Master's degree vs. PhD Candidate	0.360	0.049
PTQ → PN	Bachelor's vs. PhD Candidate	0.651	0.028
PTQ → PN	Doctorate or higher vs. PhD Candidate	0.664	0.029
PTQ → PN	High vs. Low	−0.295	0.006
	Low vs. Moderate	0.217	0.013
EC → PN	High vs. Low	0.395	0.012
	High vs. Moderate	0.359	0.024
ASE → SAT	High vs. Low	−0.331	0.032
ASE → SAT	High vs. Moderate	−0.563	0.001
	Low vs. Moderate	−0.232	0.014
ASE → PN	High vs. Low	0.203	0.042
	High vs. Moderate	0.194	0.046
PTQ → RPB	High vs. Low	−0.252	0.046
PTQ → SAT	High vs. Moderate	0.323	0.035

Table 8. Cont.

Path	Group Comparison	Difference ($\Delta\beta$)	<i>p</i> -Value
SAT → RPB	Low vs. Moderate	0.258	0.001
EC → RPB	Low vs. Moderate	−0.131	0.044
PN → RPB	Low vs. Moderate	0.151	0.035
ASE → RPB	Low vs. Moderate	−0.288	0.004
ASE → SAT	First-time Visitors vs. Repeat Visitors	−0.183	0.026
PTQ → SAT	First-time Visitors vs. Repeat Visitors	0.132	0.051

Note: $\Delta\beta$ = difference in standardized path coefficients (Group A minus Group B). *p*-values are one-tailed BCa bootstrap probabilities from 10,000 resamples; two-tailed values equal $2 \times$ the reported *p*. The $\Delta\beta$ sign marks the group with the stronger effect.

There were significant differences between the four age cohorts (18–24, 25–34, 35–44, 45–54). The effect of Aesthetic/Spiritual Experience (ASE) on Tourist Satisfaction (SAT) was more pronounced for younger tourists, and specifically for the 18–24 cohort than for 25–34 ($\Delta\beta = 0.421, p = 0.003$) and 35–44 ($\Delta\beta = 0.332, p = 0.002$). Likewise, the SAT → RPB path was stronger for younger age groups (e.g., 18–24 vs. 25–34: $\Delta\beta = 0.333, p = 0.003$). The PTQ → SAT connection was stronger for the 25–34 age group compared to 18–24 ($\Delta\beta = -0.403, p = 0.003$) and 35–44 ($\Delta\beta = 0.415, p < 0.001$), indicating developmentally different satisfaction processes. The ASE → RPB trajectory also differed considerably, with 25–34 having a stronger influence than both the 18–24 ($\Delta\beta = -0.331, p = 0.011$) and older cohorts. PTQ and EC also had stronger influences on PN for younger cohorts, with EC → PN being stronger in 18–24 than 35–44 ($\Delta\beta = 0.243, p = 0.024$) and 45–54 ($\Delta\beta = 0.477, p = 0.002$).

MGA showed gender moderation for several relationships. ASE influenced RPB more strongly in males ($\Delta\beta = 0.364, p < 0.001$), while SAT influenced RPB more strongly in females ($\Delta\beta = -0.342, p < 0.001$). In the same vein, PTQ influenced RPB ($\Delta\beta = 0.231, p = 0.002$) and PN ($\Delta\beta = 0.213, p = 0.006$) more strongly in males. In contrast, women showed more robust links from EC to both SAT ($\Delta\beta = -0.168, p = 0.012$) and RPB ($\Delta\beta = -0.159, p = 0.013$), implicating gendered pathways in affective and normative processing.

Aggregate to low, moderate, and high environmental orientation, the model showed several moderation effects where PTQ → PN was higher for Low vs. High ($\Delta\beta = -0.295, p = 0.006$) and Low vs. Moderate ($\Delta\beta = 0.217, p = 0.013$) and EC → PN was highest for High vs. Low ($\Delta\beta = 0.395, p = 0.012$) and High vs. Moderate ($\Delta\beta = 0.359, p = 0.024$). ASE had larger effects on SAT for the Low than High ($\Delta\beta = -0.331, p = 0.032$) and Moderate ($\Delta\beta = -0.232, p = 0.014$) groups. ASE → PN was stronger for Low than High ($\Delta\beta = 0.203, p = 0.042$) and Moderate ($\Delta\beta = 0.194, p = 0.046$). Other moderated effects were PTQ → RPB (Low vs. High: $\Delta\beta = -0.252, p = 0.046$), SAT → RPB (Low vs. Moderate: $\Delta\beta = 0.258, p = 0.001$), and EC → RPB (Low vs. Moderate: $\Delta\beta = -0.131, p = 0.044$). PN → RPB ($\Delta\beta = 0.151, p = 0.035$) and ASE → RPB ($\Delta\beta = -0.288, p = 0.004$) also differed significantly between groups.

Newly experienced ecotourists showed more significant effects of ASE → SAT ($\Delta\beta = -0.183, p = 0.026$), while repeat ecotourists showed a relatively stronger PTQ → SAT relationship ($\Delta\beta = 0.132, p = 0.051$). In another comparison by history of past ecotourism visits (<3 vs. >3), EC → SAT was slightly more powerful for first-time tourists ($\Delta\beta = 0.107, p = 0.052$), and so was PN → RPB ($\Delta\beta = 0.128, p = 0.055$), and the implication is that first-time ecotourists are more affective and morally sensitive to environmental appeals.

The level of education strongly moderated some pathways. EC → SAT was greater for the bachelor's level than for doctorate ($\Delta\beta = 0.419, p = 0.010$), master's ($\Delta\beta = 0.228, p = 0.012$), and high school ($\Delta\beta = 0.258, p = 0.009$). PN → RPB was higher in bachelor's graduates compared with doctoral ($\Delta\beta = 0.213, p = 0.044$), high school ($\Delta\beta = 0.203, p = 0.031$),

and PhD candidates ($\Delta\beta = 0.541, p = 0.023$). EC \rightarrow PN path was higher for bachelor's compared with high school ($\Delta\beta = 0.314, p = 0.004$) and doctoral-level participants ($\Delta\beta = 0.271, p = 0.073$). In addition, ASE \rightarrow PN ($\Delta\beta = 0.283, p = 0.005$), ASE \rightarrow RPB ($\Delta\beta = -0.475, p = 0.050$), and PTQ \rightarrow RPB (e.g., PhD versus high school: $\Delta\beta = 0.526, p = 0.014$) were significantly moderated by level of education. Lastly, PTQ \rightarrow PN was significantly greater in PhD applicants than in bachelor's ($\Delta\beta = 0.651, p = 0.028$) and doctorate degree holders ($\Delta\beta = 0.664, p = 0.029$).

Collectively, these findings suggest that demographic and experience factors—i.e., age, gender, environmental orientation, education, and previous exposure—impact the psychological mechanisms that link ecotourism experiences to sustainable behavioral intentions.

5. Discussion

The structural model results also yield strong empirical evidence for hypothesized direct effects between cognitive, affective, and normative predictors and Responsible Post-Visit Behavior (RPB). The five direct paths—Environmental Concern (EC), Perceived Trip Quality (PTQ), Aesthetic/Spiritual Experience (ASE), Satisfaction (SAT), and Personal Norms (PN)—were all significant predictors of RPB, consistent with the theoretical expectation that pre-trip disposition and in situ experience contribute to the formation of sustainable behavior outside of the ecotourism context.

5.1. Environmental Concern, Perceived Trip Quality, and Aesthetic and Spiritual Experience as Robust Predictors of Post-Visit Behavior

Ecological concern showed a statistically significant but weak direct relationship with RPB, as VBN theory suggests that concern is a general motivational context for pro-environmental behavior in favor of H1. We identify EC as a secondary rather than a primary space action motivator by the low coefficient. This is consistent with evidence for the intention–behavior gap, in which concern and intention have to be enabled conditions to be translated into action. Consistent with this, EC's most reasonable role is indirect—augmenting the impact of responsibility, awareness, and experience quality when available options and efficacy cues are present—than as a strong independent predictor. This more conservative understanding avoids overemphasizing the relationship and better accommodates theories that highlight perceived control and situational enablement in tourist contexts (Landon et al., 2018; Oviedo-García et al., 2017; Ribeiro et al., 2025; Stern et al., 1999). Yet, the low proportionate path coefficient indicates that worry, standing on its own and lacking context, perhaps may not always be enough to stimulate behavior change—a pattern replicated in the literature across the intention–behavior gap (Assaker, 2025; Memon et al., 2020). The result places the spotlight on the need to locate concern within contexts of transformation that mobilize moral engagement and emotional salience.

Perceived Trip Quality was the most significant direct predictor of RPB, supporting H2 and aligning with past research establishing the relationship between positive ecotourism activity evaluations and behavioral intention and loyalty (Ballantyne & Packer, 2005; Kim & Thapa, 2018). This outcome points out that tourists who value their ecotourism experience as efficiently run, emotionally meaningful, and educationally stimulating are more likely to translate these experiences into sustainable post-visit behavior. This is also consistent with the belief that high-quality experience constitutes a cognitive anchor—whereby tourists can integrate learning, assign meaning, and re-emphasize ecological values through reflection. Practically, this highlights the importance of experience design in the creation of behavioral outcomes and sets the core importance of interpretive messaging, service quality, and

meaning-making direction within ecotourism programming (Oviedo-García et al., 2017; Sarangi & Ghosh, 2025).

Aesthetic/Spiritual Experience also directly influenced RPB significantly, supporting H3. Its use, despite the smaller effect size compared to PTQ or PN, indicates the heretofore untested unique contribution of awe, nature connectedness, and spiritual engagement in promoting environmental stewardship (Coughlan et al., 2012; Yaden et al., 2019). These emotional encounters seem to be drivers of self-transcendence, re-directing tourists' horizons away from short-term hedonism and toward long-term ecological stewardship. This resonates with proposals for the integration of emotional and symbolic aspects into ecotourism frameworks (C.-F. Chen & Tsai, 2007; Mohammad Nasir et al., 2024), and is consistent with the Experience Economy framework, wherein authentic, emotionally resonant experiences have lasting effects on behavior (Sarangi & Ghosh, 2025). Aesthetic–Spiritual Experience offers an affective path. Awe and feeling of oneness appear to shift attention away from hedonics in the short term toward stewardship, augmenting cognitive judgments of quality. Combined, the findings point to a hybrid mechanism: cognitive appraisals (PTQ) determine meaning; affective–transcendent states (ASE) prime for moral engagement; concern provides a motivational context.

5.2. Tourist Satisfaction and Behavioral Outcomes

As H4a anticipated, Tourist Satisfaction shows a clear positive association with RPB, thus a proximal cognitive–affective mediator of experience and behavior. The result is consistent with more recent research (Nguyen et al., 2025; Sarangi & Ghosh, 2025), which has established that satisfaction, if based on emotional meaning and perceived value, results in greater behavioral commitment. But satisfaction in itself will not necessarily lead to pro-environmental behavior unless there is the reinforcement of moral duty or values convergence, according to Hansen et al. (2024). Thus, though this positive assessment of experience is significant, it is best when it is matched with other normative and affective modifications.

Personal Norms directly affected RPB to a very high level, thus supporting H4b and illustrating their pivotal status in VBN and VIP theories (Mandić & McCool, 2023; Yin, 2024). Such tourists who felt a sense of moral duty to behave in accordance with their environmental values were much more likely to exhibit sustainable behavior post-trip. This result indicates a shift away from out-driven motivations (e.g., social norms) to internalized moral requirements, and is consistent with Javed et al.'s (2025) and T. T. T. Thuy et al.'s (2025) findings, assuming Personal Norms are particularly powerful in effort-, consistency-, or sacrifice-based high-cost behaviors. It is striking to note how PN's high predictive value is evidence that ecotourism interventions that engage with personal responsibility—either through reflection, messaging, or involvement—can be more effective at bringing about long-lasting behavior change.

Together, these direct effects supply empirical support for a hybrid behavior model by combining cognitive (EC, PTQ), affective (ASE, SAT), and normative (PN) measures. The findings enhance extended VBN models with aesthetic/spiritual measures and verify the multi-dimensionality of sustainable action. Theoretically, the findings cross experience-based and value-based paradigms by providing a more integrated view of the mechanisms underlying pro-environmental action in ecotourism settings.

In practice, the results have several actionable implications: (1) improving the quality and effectiveness of ecotourism experiences can cause behavior change; (2) adding emotionally authentic and spiritually meaningful aspects can strengthen tourists' sustainability pledge; and (3) through individuals' own moral norms through education materials, re-

flective practices, or participatory conservation can be the most powerful conduit to the intention–behavior gap, which will be discussed in further detail in the next section.

5.3. Mediation Analysis Results

Mediation analysis provides strong evidence that Tourist Satisfaction (SAT) and Personal Norms (PN) are strong psychological mediators through which Environmental Concern (EC), Perceived Trip Quality (PTQ), and Aesthetic/Spiritual Experience (ASE) influence Responsible Post-Visit Behavior (RPB). All the hypothesized indirect effects were statistically significant, and in every instance, mediation was partial—i.e., the mediators conveyed a significant share of the effect, with direct influences remaining significant at the same time.

For Environmental Concern, PN and SAT were equally robust mediators of its effect on RPB. The EC → PN → RPB chain was more robust than the EC → SAT → RPB chain, indicating internalized moral responsibility, has a more central function to serve as an intervening force in bridging concern and action than emotional satisfaction. These results are consistent with the value–belief–norm (VBN) theory, which suggests that norms are a proximal motivator of environmentally important action, particularly in those with already existing ecological values (Landon et al., 2018; Ribeiro et al., 2025; Stern et al., 1999). The dominant EC on SAT on the RPB pathway also demonstrates the experiential reinforcement hypothesis (Ballantyne & Packer, 2005), where experiential meaningful travel is able to make the affective significance of past concern larger.

Perceived Trip Quality indirectly affected RPB through SAT and PN, confirming H6a and H6b. It appears that positive ecotourism experiences not only enhance emotional satisfaction but also internalization of value as a double stimulus for behavioral commitment. Consistent with cognitive-affective attitude formation theories (Kim & Thapa, 2018; Mandić & McCool, 2023; Wut et al., 2023), trip quality seems to provide a tangible evaluation system by which the tourist exists and attributes meaning to his/her experiences, arriving at affective opinions and normative change. Notably, the stability of the direct effect suggests that there are aspects of trip quality, perhaps logistical convenience, comfort, or perceived value, that may affect behavior independent of more profound psychological change, something that future research would have to distinguish out more specifically.

Aesthetic/Spiritual Experience provided the largest overall mediation effect, with the ASE → PN → RPB path larger than all other indirect paths. This is in line with recent awe, nature connectedness, and self-transcendence for tourism studies (Coghlan et al., 2012; Yaden et al., 2019) and fits with the idea that emotionally resonant and spiritually profound experiences are best for evoking moral norms. The SAT → ASE → RPB process was also significant, again showing the twofold affective-normative process by which such experiences impact outcomes. These findings add to the growing demands that transformative emotional design be included in ecotourism experiences to enable post-visit behavioral commitments (Coghlan et al., 2012; Lu et al., 2017; Yaden et al., 2019). These results make a series of theoretical contributions. They first set out the mediating role of both affective satisfaction and moral personal norms in the use of mainstream VBN models to apply to experience-based and richly emotional antecedents. They second point out the fact that mechanisms of experience do count—not so much in the transmission of information but in invoking internalized change conducive to longer-term behavior change.

5.4. Multi-Group Analysis (MGA) Results

The multi-group analysis revealed that various psychological mechanisms between the ecotourism experience and Responsible Post-Visit Behavior (RPB) were significantly moderated by demographic and experiential factors. These results capture the heterogene-

ity of tourist cognitive processing of environmental experience and formation of behavioral intentions and have significant implications for segmentation strategy and person-fit intervention design. There were also steady differences between age groups in terms of ASE and PTQ effects on SAT and RPB. 18- to 24-year-olds had more intense emotional reactions to ASE ($\Delta\beta = 0.421$ compared with 25–34), and 25- to 34-year-olds had greater ASE \rightarrow RPB effects than both the younger and the older groups. These results are consistent with lifespan developmental theories of peak emotional identification and identity exploration during early adulthood, thus making such a group highly susceptible to nature-based experiences (Sitompul, 2024; Wut et al., 2023). EC and PTQ effects on PN were also more significant for younger age groups, indicating that internalized environmental norms develop earlier in life and are more open to change at the outset of identity formation.

The gendered MGA manifested differential motivational processes. Men exhibited greater ASE \rightarrow RPB association, while women exhibited greater SAT \rightarrow RPB linkage. This can be understood as gendered emotional processing styles wherein women are more attuned to affective satisfaction and men are more propelled by experiential aesthetics (Brochado, 2019; Coudounaris & Sthapit, 2017). Furthermore, EC elicited more powerful effects on SAT and RPB among women and implies that ecological worry provokes affective and behavioral responses more strongly in women, as seen in earlier work on gendered sensitivity to the environment.

Environmental orientation emerged as a potent moderator, particularly for affective and normative channels. Low ecological orientation visitors had weaker EC \rightarrow PN and PTQ \rightarrow PN associations but stronger ASE \rightarrow SAT effects, suggesting more dependence on emotional as opposed to value-based processes. These trends affirm dual-process theories, in which low-preparedness individuals are more susceptible to experiential stimuli and high-preparedness individuals more on beliefs and values (Folmer et al., 2013; Jorgenson et al., 2019). This increased susceptibility of low-orientation visitors to affective cues also has strategic implications: immersive, awe-inspiring experiences can serve as effective gateway portals to environmental learning.

Less experienced and novice ecotourists indicated higher emotional and normative sensitivity, as evidenced by stronger ASE \rightarrow SAT and EC \rightarrow SAT relationships. This supports the argument that early experiences shape early norms and attitudes and helps arguments direct towards novice ecotourists transformational propositions (Ballantyne & Packer, 2005). The decline effects noticed among repeat visitors also confirm the habituation hypothesis, where familiarity over time may decrease novelty and affective importance.

Educational level moderated a number of principal paths, especially those involving EC, PN, and ASE. Bachelor-degree responders consistently exhibited more intense normative and affective paths compared with the higher and lower education groups. To illustrate, the EC \rightarrow PN and PN \rightarrow RPB paths were significantly stronger in bachelor-level responders. To our surprise, the PhD students demonstrated smaller ASE \rightarrow RPB and PN \rightarrow RPB effects, perhaps because of cognitive filtering or detachment because of disciplinary skepticism or desensitization to persuasion mechanisms. The findings indicate that education affects not just environmental literacy but also the extent to which individuals internalize and respond to ecotourism experience (Pham & Khanh, 2021; Sana et al., 2023; Wut et al., 2023).

Collectively, the MGA takes a systemic segmentation into account: novice and inexperienced ecotourists are most vulnerable to affective pathways (ASE \rightarrow SAT) that induce early norm formation, while high environment-focused visitors or well-educated ones process experience through cognitive and normative channels (EC/PTQ \rightarrow PN \rightarrow RPB). Men are more immediately affected by experience-driven awe, whereas women embed environmental concern and satisfaction in action more deeply. These patterns suggest a step-stair model of change: start with strong, awe-some cues for new-comers or low-

orientation visitors, and supplement with value-congruent quality signals and selective norm activation to build on strong, post-visit action—dosing novelty and stewardship functions for repeat visitors to counteract habituation (Table 9).

Table 9. Thematic synthesis of MGA findings.

Moderator	Stronger Pathways (Relative to Comparison Group)	Interpretation for Design/Segmentation
Age	18–24: ASE → SAT, EC/PTQ → PN↑; 25–34: ASE → RPB↑	Younger cohorts are affectively and normatively more receptive to the younger generations; early-adult (25–34) travelers convert awe into action easiest. Apply richly emotive interpretation with the addition of youth/early adult norm cues.
Gender	Men: ASE → RPB↑; Women: EC → (SAT/RPB)↑ and SAT → RPB↑	Men are drawn to raw aesthetic/spiritual effect; women direct concern and satisfaction into action. Adapt messaging: awe-inducing experience for men; concern- and satisfaction-building for women.
Environmental orientation	Low orientation: ASE → SAT↑; High orientation: EC/PTQ → PN↑	Low-preparedness travelers are guided by affective cues; high-preparedness are subjected to cognitive/normative filtering. Begin with arousing awe for low orientation; employ value- and quality-similar norm cues for high orientation.
Prior ecotourism experience	Novices: ASE → SAT↑ and EC → SAT↑; Repeat visitors: attenuation (habituation)	First-timers are more moved by emotion and concern; repeaters need novelty/expanded stewardship functions or else they will habituate.
Education	Bachelor's: EC → PN↑ and PN → RPB↑; Doctoral: smaller ASE → RPB and PN → RPB	Moderate education shows greater norm internalization; very high education potentially screens affect. Balance experiential and analytic construction by education.

6. Practical Implications

The results of the research provide informative input to the various stakeholders involved in planning, delivering, and regulating ecotourism experiences and sustainability programs. Through the mapping of cognitive, affective, and normative processes that form Responsible Post-Visit Behavior (RPB) and demographic and experiential differences in these routes, the research provides an evidence-based model for more focused interventions. The consequences are grouped into three general categories: policy formulation, managerial ecotourism practices, and environmental education and community outreach.

6.1. Implications for Policymakers

For policy makers wishing to encourage sustainable tourist behavior, the findings of the study suggest the need to influence affective experiences alongside the personal norms of tourists. That Environmental Concern (EC) and Personal Norms (PN) are such significant predictors of responsible behavior suggests that policy needs to extend beyond the provision of information and encourage reflective consideration of environmental values. This can be facilitated by tourism and environment ministries by subsidizing nature-based recreation that incorporates the possibilities of affective engagement and moral reflection—e.g., guided interpretation, cultural narrative, and spiritual immersion. Policies legitimizing and normalizing satisfaction-facilitating practices, particularly for young and novice ecotourists, can foster environmental commitment in the long run (Sitompul, 2024; Stronza et al., 2019). Additionally, demographic variations in psychological processing indicate that inclusive tourism policy must consider age, level of education, and

environmental orientation in guiding communication campaigns and public awareness programs. Additionally, the fact that some of the main impacts are through personal norms indicates that values-based policy framing (civic duty, stewardship, intergenerational equity, for example) will be a more fruitful approach than utilitarian or information-only campaigns. Policy interventions that engage these moral values through message- or experience-based nudges may achieve more profound behavioral change (Wondirad, 2019).

6.2. Implications for Business Managers and Ecotourism Providers

For destination managers and ecotourism operators, the findings of the study provide explicit directions on how tour experiences should be designed in order to induce post-trip sustainable behavior. The significant and strong path from Perceived Trip Quality (PTQ) and Aesthetic/Spiritual Experience (ASE) to Satisfaction (SAT) and RPB indicates how central experience design is to sustainability outcomes. Investments in scenery, emotional engagement, and cultural authenticity are not just attractive from a customer satisfaction point of view but also as tools for promoting pro-environmental behavior.

That satisfaction mediates between experiential antecedents and responsible behavior implies that providers must attend not only to logistical quality (i.e., service, comfort), but also to creating emotionally compelling and pedagogical experiences. Programs that connect personal enjoyment with ecological contemplation—e.g., nature journaling, environmental rituals, or post-activity reflection—can heighten satisfaction while reinforcing environmental norms (Wut et al., 2023; Zhang & Deng, 2024).

Notably, multi-group differences within the model show that segmentation of customers can enhance the performance of ecotourism experiences. Younger travelers (18–24) were more sensitive to aesthetic and emotional elements, whereas older travelers had greater concern for satisfaction and value consistency. Managers can apply this knowledge to product segments: emotionally arousing, novelty-experience activities for younger segments, and value-confirming, learning-based activities for older or experienced consumers.

Also, the fact that novice ecotourists and those with fewer than three previous trips were more susceptible to both satisfaction and norm formation suggests that initial ecotourism experiences are a formative touch point. Firms should place special emphasis on familiarizing novice ecotourists, and these initial exposures should be carefully designed, emotively engaging, and with clear connections made to sustainability principles.

6.3. Implications for Environmental Educators and Campaign Designers

Personal Norms and Satisfaction's mediator effects also promise to be useful for environmental educators and NGOs engaged in behavioral change initiatives. What the study indicates is that responsible behavior is not merely a function of early concern with the environment but is conditioned and facilitated through experiential learning and emotional attachment. Environmental education must, therefore, embrace experiential pedagogies such as ecotourism study tours, field-reflection exercises, and local community-based projects to bring about internalized commitment towards environmentally sustainable behavior.

Consistent with the increased emotional and normative sensitivity among women and youth subjects, education campaigns may look toward using emotionally engaging narratives and peer-to-peer learning presentations as forms of outreach, particularly in youth programs (Wut et al., 2023; Zhang & Deng, 2024). In addition, the extensive pathways from EC and PTQ to PN indicate that emphasizing the personal importance and richness of ecological experience—over its informational content, per se—can help increase perceived moral commitments to act ecologically.

Educational activities must also be directed towards lower-engagement groups, including those with low environmental orientation or limited prior experience with ecotourism. These groups were found within the study to be more radically affected by aesthetic and emotional concerns than by normative pressures. Thus, initial contact can include recourse to grabbing attention and engaging emotionally through experiential involvement or emotionally resonant storytelling before gradually adding moral and behavioral norms.

Lastly, collaboration between educators and ecotourism operators could further enhance the strengths of the two fields. For example, planning visitor experience in synchronization with curriculum objectives or developing outreach materials that link trip experience to daily environmental habits can build post-visit behavioral spillover.

7. Conclusions

In this study, we investigated the process by which ecotourism experience is converted into Responsible Post-Visit Behavior (RPB) through a double-sidedness mechanism based on affect (Satisfaction, SAT) and morality (Personal Norms, PN). Employing SEM on a large sample of ecotourists, we identified that Environmental Concern (EC), Perceived Trip Quality (PTQ), and Aesthetic/Spiritual Experience (ASE) each have direct effects on RPB and indirect effects through SAT and PN. Among the mediators, PN always showed a stronger path, and internalized obligation was stressed as playing a significant role in continuing behavior post-trip. Multi-group analyses reported consistent variation by age, gender, education, experience, and environmental orientation, suggesting that affective and normative paths are not similarly activated for varying visitor segments. In theory, the model combines experience-based (NAM) and value-based (VBN) approaches; in practice, it guides policymakers and operators towards good-quality experiences with norm-activating sparks making sustainable options simple, transparent, and compelling.

Limitations and Future Directions

While this study takes important steps towards an understanding of how ecotourism experiences affect responsible post-visit action, several areas remain open to future research that can consolidate and expand upon the current findings. Although this investigation contributes to the literature on how ecotourism experiences relate to Responsible Post-Visit Behavior (RPB), a number of design features temper generalizability and causal inference, and, in doing so, intimate directions for future research. First, the cross-sectional survey design cannot determine temporal precedence, especially for mediation pathways through Satisfaction (SAT) and Personal Norms (PN). As such, the indirect effects presented herein are to be interpreted as statistical (not temporal) mediation. Future studies are advised to use time-separated or longitudinal designs (i.e., pre-trip on in-situ and eventually on post-trip waves), cross-lagged panel models, or latent-growth methods in order to examine directionality, stability, and the difference between short-term priming vs. enduring change (Wut et al., 2023; Zhang & Deng, 2024). Second, all the constructs were obtained from a single source at a single point in time. While we pre-tested for common-method bias, post hoc tests such as Harman's one-factor are restrictive. To minimize social-desirability, recall, and consistency motives, future studies need to (i) incorporate marker variables and procedural remedies (temporal and psychological distance between the surveys), (ii) incorporate a social-desirability scale as a method of modeling bias in an explicit manner, and (iii) triangulate using objective or trace data (e.g., conservation partner donations, carbon-offset purchases, public-transit fares, citizen-science participation, or smart-card/booking records). Ecological momentary assessment (EMA) and short in-app cues during/after task will also prevent recall error (Sahahiri et al., 2023; Stronza et al., 2019). Third, the single-country setting and purposive/snowball sampling design restrict representativeness

and enable self-selection (ecologically oriented tourists potentially over-sampled). Future studies ought to use probability or quota sampling at multiple sites across different destinations and management regimes, include a priori power reporting of comparisons of sub-groups, and perform cross-cultural replications in order to enable policy and cultural contingencies to be examined. Fifth, the model specification did not include potentially important antecedents and constraints (e.g., subjective norms, habit strength, perceived costs/affordances). Including such variables, investigating endogeneity (e.g., Gaussian-copula or instrumental-variable corrections) and assessing unobserved heterogeneity (e.g., FIMIX-PLS or latent-class SEM) would improve inference. In multi-group research, future analyses would also be improved by including effect sizes with confidence intervals and family-wise error control (e.g., Holm–Bonferroni) for multiple tests (Sana et al., 2023; Wut et al., 2023). Lastly, to close the gap between association and effect, managers and scientists ought to try out field interventions such as framing eliciting awe and linking it with personal norms, promise of commitment, norm-prompts at touchpoints, and “easy-first” friction-reducing alternatives, and test them with A/B tests or cluster-randomized trials with behavioral outcomes. All these will elucidate mechanisms, increase generalizability, and guide the design of scalable, evidence-based interventions to translate ecotourism experiences into long-lasting pro-environmental behavior (Rhama, 2020; Sitompul, 2024). Subsequent research needs to include explicit transformational processes (e.g., identity work, critical reflection) and employ time-discrete or longitudinal mixed methods to determine durability and spillovers “beyond the vacation,” thus making our ASE on the PN pathway directly transferrable to longer-term transformation. The development of new digital and hybrid ecotourism models—like virtual visitation, immersive applications, and gamified sustainability interactions—poses new research questions. Experiments on whether these digital experiences can also provide the same amounts of satisfaction and norm activation as traditional in vivo ecotourism may offer insights into how technology can spread environmental messaging to a wider audience that cannot otherwise travel. Also, research in the future can look at spillover from attitudes formed due to ecotourism. For example, how do people who become environmentally aware during a vacation take it beyond the vacation (e.g., at the supermarket, political activism, or household energy consumption). Looking at the diffusion of that behavior could inform larger-scale sustainability education initiatives (Liu & Chamaratana, 2024; Pham & Khanh, 2021).

This research demonstrates that a well-designed ecotourist experience, when combined with personal norm activation, leads to increased levels of responsible post-visit behavior. Trip quality and aesthetic-spiritual experience work through satisfaction and even more through personal norms. In practice, operators and policymakers must integrate high-quality service and interpretation with pro-environmental low-friction options and salient norm prompts, segmented by visitor type. Lastly, our research provides a step-by-step guide to converting encounter into commitment: When meaning, quality, and moral purpose converge, care continues on beyond the trip. The path of inquiry does not stop here. In the future, research—through time and place, emotion and structure—can shed light on the way wonder sparks values and the way action radiates outward from one step in the forest. Rather than a projection of what is, let evidence lead us to a more accountable relationship between people and the places they travel to.

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Appendix A

Table A1. Measurements used for data analysis.

Environmental Concern (EC)		
EC1	I am very concerned about the environmental problems we face today.	Adapted from Dunlap et al. (2000) and Zammitti et al. (2023)
EC2	I believe we must take stronger action to protect the natural environment.	
EC3	I feel personally responsible for helping reduce environmental damage.	
EC4	Protecting the environment is one of the most important issues today.	
EC5	I actively look for ways to minimize my environmental footprint.	
Perceived Trip Quality (PTQ)		
PTQ1	I found the trip well-organized and smoothly executed.	Adapted from Martínez-Roget et al. (2020) and C.-F. Chen and Tsai (2007)
PTQ2	The ecotourism experience exceeded my expectations.	
PTQ3	I would recommend this ecotourism experience to others.	
PTQ4	I felt emotionally engaged throughout the visit.	
PTQ5	I gained new knowledge or insights during the trip. (deleted)	
Aesthetic/Spiritual Experience in Nature (ASE)		
ASE1	I felt a deep sense of peace during my time in nature.	Adapted from Coghlan et al. (2012) and Lu et al. (2017)
ASE2	I was moved by the beauty of the natural surroundings.	
ASE3	The experience gave me a sense of connection to something larger than myself.	
ASE4	I felt emotionally uplifted by the environment I visited.	
ASE5	Being in nature during the trip was a spiritual experience for me. (deleted)	
Tourist Satisfaction (SAT)		
SAT1	Overall, I am satisfied with my ecotourism experience.	Adapted from V. T. T. Thuy (2025)
SAT2	The trip met or exceeded my expectations.	
SAT3	I am happy with the quality of the ecotourism services provided.	
Personal Norms (PN)		
PN1	I feel a personal obligation to act in environmentally friendly ways.	Adapted from Stern et al. (1999)
PN2	I believe I should help protect the environment, even if it requires effort.	
PN3	Acting pro-environmentally reflects my personal values.	
Responsible Post-Visit Behavior (RPB)		
RPB1	Since my trip, I have tried to adopt more environmentally friendly habits.	Adapted from Dias et al. (2021)
RPB2	I intend to support conservation organizations or causes.	
RPB3	I now make more sustainable choices in my everyday life.	

Table A2. Cross-loading matrix.

	ASE	EC	PN	PTQ	RPB	SAT
ASE1	0.886	0.012	0.525	0.596	0.515	0.497
ASE2	0.826	0.024	0.482	0.565	0.484	0.425
ASE3	0.918	−0.064	0.473	0.508	0.439	0.547
ASE4	0.906	−0.087	0.483	0.508	0.446	0.579
EC1	−0.030	0.827	−0.194	−0.019	−0.028	−0.131
EC2	0.002	0.807	−0.167	0.071	0.044	−0.069
EC3	0.014	0.798	−0.208	0.123	−0.024	−0.079
EC4	−0.041	0.645	−0.014	−0.060	0.036	−0.072
EC5	−0.111	0.697	−0.089	−0.054	0.013	−0.124
PN1	0.498	−0.133	0.891	0.374	0.421	0.274
PN2	0.473	−0.241	0.893	0.382	0.492	0.332
PN3	0.514	−0.179	0.887	0.389	0.430	0.427
PTQ1	0.418	−0.000	0.302	0.759	0.503	0.391
PTQ2	0.459	0.088	0.335	0.817	0.481	0.454
PTQ3	0.572	0.020	0.335	0.794	0.405	0.403
PTQ4	0.508	0.013	0.386	0.802	0.472	0.414
RPB1	0.345	0.009	0.413	0.386	0.720	0.220
RPB2	0.516	−0.029	0.477	0.619	0.903	0.509
RPB3	0.453	0.028	0.369	0.433	0.874	0.436
SAT1	0.390	−0.092	0.240	0.412	0.228	0.725
SAT2	0.536	−0.059	0.323	0.551	0.512	0.855
SAT3	0.378	−0.174	0.336	0.165	0.305	0.713

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