

To appear in: Geoconservation Research (GCR)

Online ISSN: 2588-7343

Print ISSN: 2645-4661

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Received: 22-May-2026

Revised: 12-Jun-2026

Accepted: 17-Jun-2026

Accepted manuscript (author version)

DOI: <https://doi.org/10.57647/gcr.2026.0901.04>

Original Research

How Tourists' Flow Experience Relates to Cultural-Natural Destination Advocacy through Restorative Encounters - Aras UNESCO Global Geopark in Iran

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Abstract

Key psychological elements of tourism include flow experience, restorative experience, and destination advocacy intention, yet their interrelationships are inadequately understood. This study investigates how flow experience influences destination advocacy intention through restorative experience, with implications for geoheritage conservation. Grounded in the Stimulus-Organism-Response (S-O-R) framework, a model was tested using PLS-SEM on data from 288 visitors to Aras UNESCO Global Geopark (UGGp), Iran. All four hypotheses were supported: flow experience enhances restorative experience; restorative experience influences destination advocacy intention; flow experience directly affects destination advocacy intention; and restorative experience partially mediates this relationship. The model explains 39% of variance in advocacy intention and 21% in restorative experience. This study extends the S-O-R framework to geoparks, advances Attention Restoration Theory by identifying flow as an antecedent of restorative perception and reconceptualizes advocacy as conservation citizenship. By demonstrating that flow and restoration cultivate conservation-supportive intentions, this research positions visitor experience management as an integrated geoconservation tool. Practical outcomes may include design of flow-inducing experiences, enhancing restorative qualities, and cultivating tourist advocacy to support geological heritage protection in geoparks.

Keywords: Flow Experience, Restorative Experience, Destination Advocacy Intention, Tourism, Aras UGGp

Introduction

Understanding how psychological experiences during tourism translate into pro-destination behaviors is a central concern in tourism research. Cultural-natural heritage landscapes, places where geological features, ecological systems, and human history converge, offer unique settings for examining the psychological mechanisms through which visitors form deep attachments and subsequent advocacy intentions (Dowling & Newsome 2017; Gordon 2018). Among the diverse psychological states that tourists may experience in such landscapes, flow experience, characterized by intense focus, absorption, enjoyment, and time distortion, has emerged as a particularly significant construct for understanding optimal tourist experiences (Csikszentmihalyi 1990; Song *et al.* 2025). Similarly, restorative experience, the sense of psychological recovery and renewal derived from being in certain environments, has been identified as a key mechanism through which natural and heritage settings contribute to visitor well-being (Kaplan & Kaplan 1989; Qiu *et al.* 2021). Despite growing recognition of these psychological states as important components of the tourist experience, the pathways through which flow experience influences destination advocacy intention, comprising destination defense, information sharing, and positivity (Gupta & Singh 2025), remain inadequately understood, particularly in the context of cultural-natural landscapes.

Geotourism and the conservation of geoheritage have received increasing scholarly attention internationally, including a growing body of research focused specifically on Iran. A systematic review by Ziaee and Ferdowsi (2020) documented 129 published articles on geotourism in Iranian journals between 2006 and 2018, revealing a period of considerable growth followed by signs of theoretical saturation, and identifying directions for future innovative research. Studies on Iranian geotourism have addressed several important themes: the conservation management of geotourism attractions through models integrating geotourism resources, people, and government (Pourfaraj *et al.* 2020); the vulnerability of geoheritage in tourism destinations, with findings highlighting how social issues such as low public awareness and lack of sense of belonging increase vulnerability, alongside inadequate physical infrastructure and economic pressures (Ferdowsi 2025b); evaluation of management interventions for geoheritage conservation, which identified transparency, inclusion, institutionalization, communication, implementation, and efficiency as key dimensions (Ranjbar Motalegh & Ferdowsi 2025); and geoeducation as a mechanism for geoheritage conservation through clarifying, communicating, and aligning dimensions (Ferdowsi *et al.* 2025a).

Additional contributions include geodiversity assessments in the Zagros region ([Ahmadi et al. 2022](#)), geoconservation at specific sites such as the Namakdan Salt Caves within Qeshm Island UGGp ([Amrikazemi & Sayedyounesi 2025](#)), aerial geotourism as a novel approach to reducing physical pressure on geosites ([Maghsoudi et al. 2021](#)), strategic planning for wetland geotourism development ([Izadi et al. 2025](#)), geopark management frameworks integrating development and conservation ([Ferdowsi & Németh 2026](#)), geoheritage resilience assessment for geoconservation planning ([Moradipour et al. 2024](#)), and geodiversity documentation at Tabas UGGp ([Sheibani & Zamanian 2023](#)). Collectively, these studies demonstrate that Iranian geotourism research has predominantly concentrated on managerial, conservation, geosite assessment, and geodiversity evaluation aspects. However, despite this substantial body of work on the physical and managerial dimensions of geoheritage in Iran, the psychological dimension of the tourist experience, encompassing constructs such as flow experience, restorative experience, and destination advocacy intention, has not yet been empirically examined within Iran's geoparks. This represents a significant gap, as understanding how tourists psychologically engage with geoheritage landscapes can inform strategies that complement existing conservation and management approaches.

Aras UGGp, located in the East Azerbaijan Province of northwestern Iran near Tabriz, provides an ideal setting for investigating these psychological processes. Ratified as a UNESCO Global Geopark, Aras UGGp encompasses a region of exceptional geological diversity, including volcanic formations, river canyons, and mineral springs, alongside a rich cultural heritage that includes ancient settlements, traditional irrigation systems, and Armenian monasteries ([Al-Halbouni et al. 2022](#), [Wahyuningrum & Putri 2025](#)). Such geocultural heritage features, of which qanats (traditional subterranean irrigation channels) are a quintessential example, combining geological, engineering, cultural, and aesthetic dimensions ([Ferdowsi et al. 2025b](#)), enriching the visitor experience by demonstrating the deep historical interplay between human civilization and geological resources. The geopark's designation under UNESCO's framework, which emphasizes geoheritage conservation, Earth science education, and sustainable local development, positions it as a cultural-natural landscape where visitors encounter both spectacular geological features and millennia of human adaptation to challenging environmental conditions ([Wang et al. 2022](#); [Nyulas et al. 2024](#)).

Flow experience, originally theorized by [Csikszentmihalyi \(1975, 1990\)](#) as the optimal experience state in which individuals become completely absorbed in an activity, has received increasing attention in tourism research ([Karasakal & Albayrak 2021](#); [Song et al. 2025](#)). In

tourism contexts, flow is characterized by three core dimensions: cognitive absorption reflecting complete focus on the experience, time distortion indicating the sense that time passes quickly, and enjoyment representing the intrinsic pleasure derived from the activity (Kim & Ko 2019). Research has demonstrated that flow experience positively influences tourist satisfaction, memorable experiences, and behavioral intentions across diverse settings including adventure tourism, cultural tourism, and nature-based tourism (Yang *et al.* 2022; Matos *et al.* 2023; Nasution *et al.* 2023). However, the specific relationship between flow experience and destination advocacy intention, particularly in natural-cultural contexts, has received limited empirical attention.

Restorative experience, grounded in Attention Restoration Theory (Kaplan & Kaplan 1989; Kaplan 1995), refers to the psychological recovery that individuals experience when exposed to environments possessing specific restorative qualities: being away or psychological distance from routine demands, fascination representing effortless capture of attention, extent indicating sufficient scope for immersion, and compatibility reflecting alignment between individual intentions and environmental affordances (Lehto 2012; Zhai *et al.* 2025). In tourism contexts, restorative experience has been linked to improved well-being, reduced stress, and enhanced destination loyalty (Choi *et al.* 2023; Li & He 2023; Zhou *et al.* 2023). Natural-cultural landscapes such as Aras UGGp, with their combination of natural beauty, cultural depth, and opportunities for solitude, appear particularly well-suited to facilitate restorative experiences (Gordon 2018; Qiu *et al.* 2021).

Destination advocacy intention, defined as tourists' willingness to recommend, defend, and speak positively about a destination to others, represents a critical behavioral outcome for tourism destinations (Hossain *et al.* 2022; Lever *et al.* 2022; Gupta & Singh 2025). Unlike mere satisfaction or revisit intention, advocacy encompasses active promotion of the destination, functioning as a form of organic tourist-generated marketing that can significantly influence potential visitors' decision-making (Kumar *et al.* 2022; Srivastava *et al.* 2022).

Despite the theoretical and practical significance of these constructs, several important gaps persist in the literature. First, while existing Iranian geotourism research has substantially advanced knowledge on conservation management (Pourfaraj *et al.* 2020), vulnerability assessment (Ferdowsi 2025b), management interventions (Ranjbar Motalegh & Ferdowsi 2025), geoeducation (Ferdowsi *et al.* 2025a), and geopark management frameworks (Ferdowsi & Németh 2026), these studies have focused on managerial, institutional, and physical

dimensions of geoheritage rather than the psychological experiences of tourists. The role of flow experience as an antecedent of restorative experience in natural-cultural landscapes, including geoparks, has not been empirically examined, either internationally or within the Iranian context. Second, the direct and indirect effects of flow experience on destination advocacy intention through restorative experience as a mediator remain unexplored. Third, the Stimulus-Organism-Response framework (Mehrabian & Russell 1974), which provides a coherent architecture for understanding how environmental stimuli shape internal psychological states and subsequent behavioral responses, has not been applied to integrate flow experience as stimulus, restorative experience as organism, and destination advocacy intention as response within a unified model. Fourth, empirical testing of such an integrated model in a UNESCO Global Geopark context, particularly in the understudied Middle Eastern region where the psychological dynamics of geotourist experiences have been overshadowed by managerial and conservation-oriented research, has not yet been undertaken.

To address these gaps, this study develops and empirically tests a conceptual model grounded in the S-O-R framework, positioning flow experience as the stimulus, restorative experience as the organismic state, and destination advocacy intention as the behavioral response. The study is situated within Aras UGGp in Iran, drawing on data collected from visitors to this cultural-natural landscape (Fig.1).

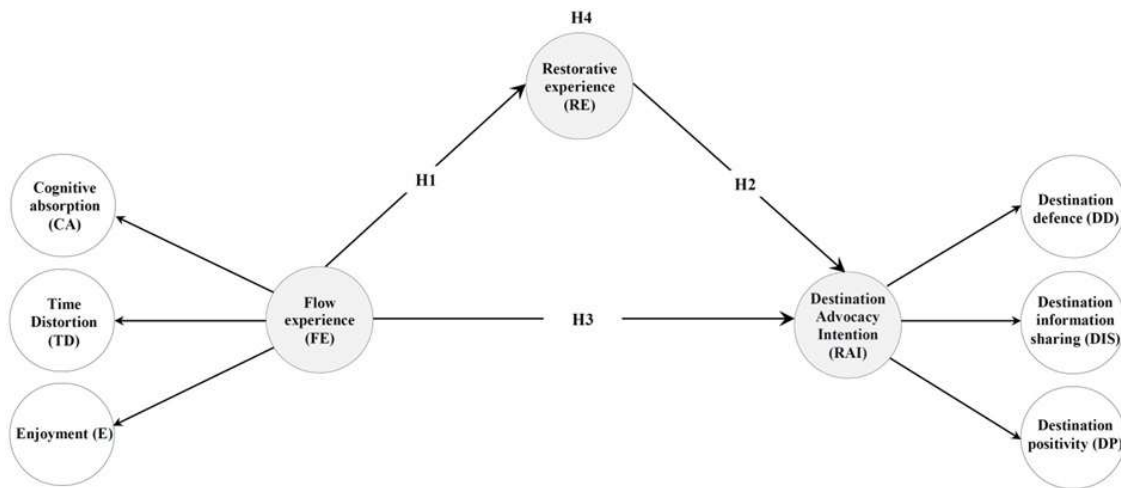


Figure 1. Conceptual model.

Theoretical Framework and Hypotheses Development

The conceptual model of this study is grounded in the Stimulus-Organism-Response framework, originally developed by Mehrabian and Russell (1974) in environmental psychology. The S-O-R model provides a parsimonious yet comprehensive architecture for

understanding how environmental cues and internal psychological states interact to shape behavioral responses (Ding *et al.* 2019; Xu *et al.* 2023). Within this framework, Stimulus refers to external environmental factors or internal psychological triggers that capture an individual's attention and initiate a response sequence. Organism encompasses the intervening cognitive and affective states that mediate between the stimulus and the response. Response represents the behavioral outcomes, including approach or avoidance behaviors (Mehrabian & Russell 1974; Fu *et al.* 2020).

The S-O-R framework has been widely applied in tourism and consumer behavior research to explain how various stimuli influence tourists' internal states and subsequent behavioral intentions (Martínez *et al.* 2024; Zhu *et al.* 2025). In this study, we operationalize flow experience as the psychological stimulus arising from tourists' engagement with the natural-cultural landscape, restorative experience as the organismic state that mediates between stimulus and response, and destination advocacy intention as the behavioral response.

Based on this theoretical foundation, four hypotheses were developed. First, when tourists enter a state of flow while engaging with the cultural-natural landscape of Aras UGGp, they become deeply immersed in the experience, losing awareness of external distractions and everyday concerns. This state of absorption facilitates the being away dimension of restorative experience by creating psychological distance from routine demands (Kaplan 1995; Lehto 2012). Therefore:

H1: flow experience has a positive and significant effect on tourists' restorative experience.

Second, when tourists perceive a destination as restorative, as a place where they can recover from mental fatigue and experience psychological renewal, they are more likely to develop positive behavioral intentions toward that destination. Tourists who experience psychological restoration at a destination are more likely to form positive memories, develop emotional attachments, and express favorable attitudes, all of which contribute to advocacy intentions (Hossain *et al.* 2022; Matos *et al.* 2023). Therefore:

H2: restorative experience has a positive and significant effect on tourists' destination advocacy intention.

Third, beyond indirect effects through restorative experience, flow experience may directly influence destination advocacy intention. The S-O-R framework accommodates direct stimulus-response pathways when emotional or psychological experiences are sufficiently

potent (Mehrabian & Russell 1974; Xu *et al.* 2023). Tourists who experience flow during their visit are likely to form strong positive memories and develop deep emotional connections to the destination. These positive psychological outcomes may directly motivate advocacy behaviors (Srivastava *et al.* 2022; Matos *et al.* 2023). Therefore:

H3: flow experience has a positive and significant effect on tourists' destination advocacy intention.

Fourth, building upon the S-O-R framework, restorative experience is proposed to serve as a mediating mechanism in the relationship between flow experience and destination advocacy intention. When tourists are in a flow state, they are more present and more attentive to the positive affordances of the environment (Song *et al.* 2025). This heightened state of engagement amplifies perceptions of restorative qualities, which in turn generate positive affect and motivate tourists to advocate for the destination (Hossain *et al.* 2022; Li & He 2023). Therefore:

H4: restorative experience mediates the relationship between flow experience and destination advocacy intention.

Figure 1 presents the conceptual model of this study, illustrating the hypothesized relationships among flow experience (stimulus), restorative experience (organism), and destination advocacy intention (response), including the proposed mediating pathway.

Method

To empirically examine the hypothesized relationships among flow experience, restorative experience, and destination advocacy intention within a cultural-natural heritage context, this study adopted a quantitative, cross-sectional survey design.

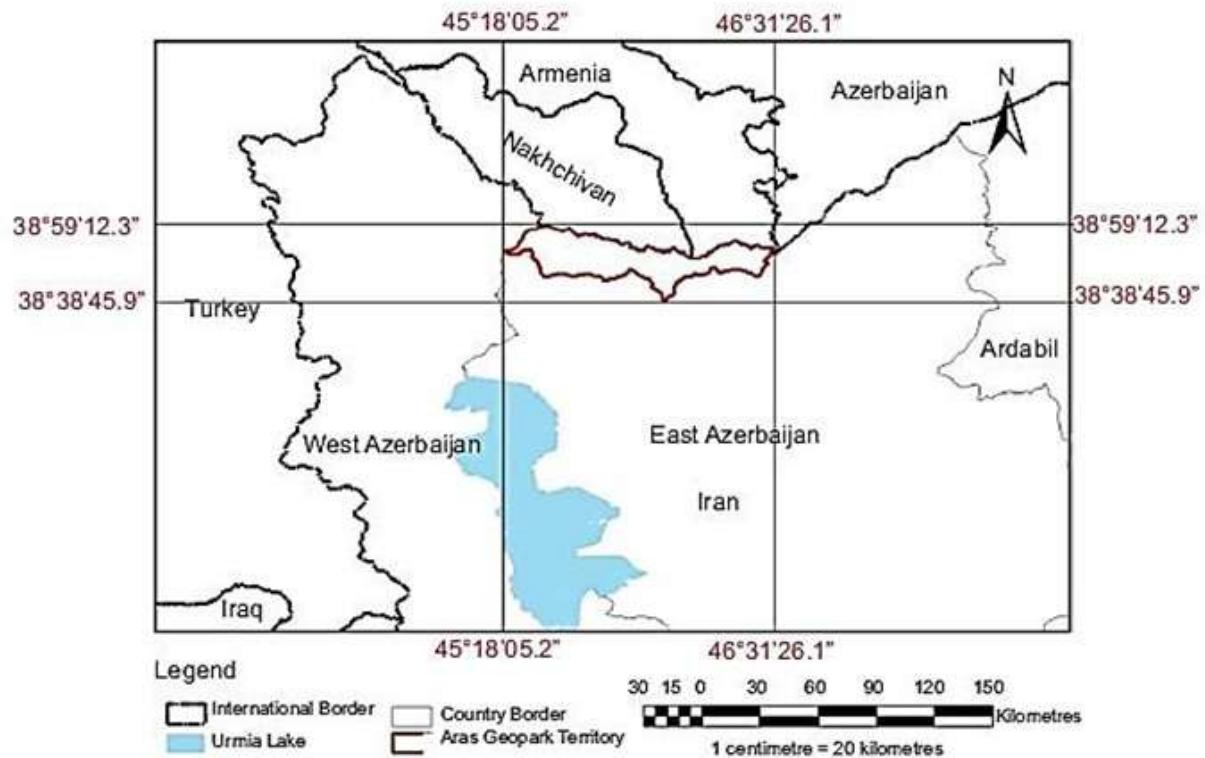


Figure 2. Geographical location of Aras UGGp in Iran (Sadry *et al.* 2022).

Study Context and Population: The research was conducted at Aras UGGp, located in Jolfa County, East Azerbaijan Province, and northwestern Iran (**Fig. 2**). Covering an area of 1,670 km², the geopark is managed by the Aras Global Geopark Office under the Aras Free Zone Organization, with funding derived from a combination of visitor service revenues and government budget allocations (Ferdowsi & Davoodi Ilkhechi 2025). Ratified as a UNESCO Global Geopark, Aras UGGp represents one of Iran's contributions to the UNESCO Global Geoparks Network, which had grown to 241 geoparks across 51 countries by 2026 (www.unesco.org).

Geologically, Aras UGGp is part of the Lesser Caucasus terrane, shaped by the collision of the Iran-Eurasia plates in the late Triassic and subsequently the Arabian-Central Iran microcontinents in the late Miocene. The Permian-Triassic Boundary, observable within the geopark, is considered its most significant geological feature of international importance (UNESCO 2023). The topography is generally steep, forming dramatic landscapes, with altitudes ranging from Kiyamaki Mount at 3,347 m to the Aras River valley at 720 to 390 m. The climate supports diverse vegetation, with subtropical trees in the Aras valley, steppe dominating the western and middle parts, and the dense Arasbaran forests covering the eastern

slopes. The Aras River forms the northern boundary of the geopark with Armenia and the Nakhchivan Autonomous Republic. The geopark encompasses a region of considerable geological diversity, including Paleozoic-Mesozoic sedimentary rock sequences, particularly the conformable Permian-Triassic transition, extensive granitic plutonic provinces in the eastern sector, the volcanic and sub-volcanic Kiyamaki dome, compression-related structural features such as faulting, thrusting, and folding resulting from Alpine Orogeny, fossil localities, travertine-depositing mineral springs, and the Aras River with its associated geomorphic features (Ferdowsi & Davoodi Ilkhechi 2025).

These diverse geological phenomena expose different orogenic phases, formative processes, and the evolutionary history of the planet, offering rich opportunities for flow-inducing engagement through activities such as fossil identification, geological interpretation, and landscape observation. The chromatic diversity of these geological features, ranging from the variegated sedimentary strata of the Permian-Triassic transition to the mineral hues of volcanic and plutonic formations, further contributes to the aesthetic dimension of visitor experience, as color plays a recognized role in shaping perceptions of geoheritage beauty, sense of place, and interpretive understanding in geotourism destinations (Ferdowsi *et al.* 2025c). The importance of color extends beyond geological aesthetics to the broader visitor experience; Ferdowsi and Shokri Firozjah (2014) have argued that thoughtful chromatic planning in spaces contributes substantially to identity preservation and sense of place, principles that are equally applicable to the design of interpretive infrastructure and visitor facilities within geoparks. Figure 3 shows the geosites list of Aras UGGp (Fig. 3).

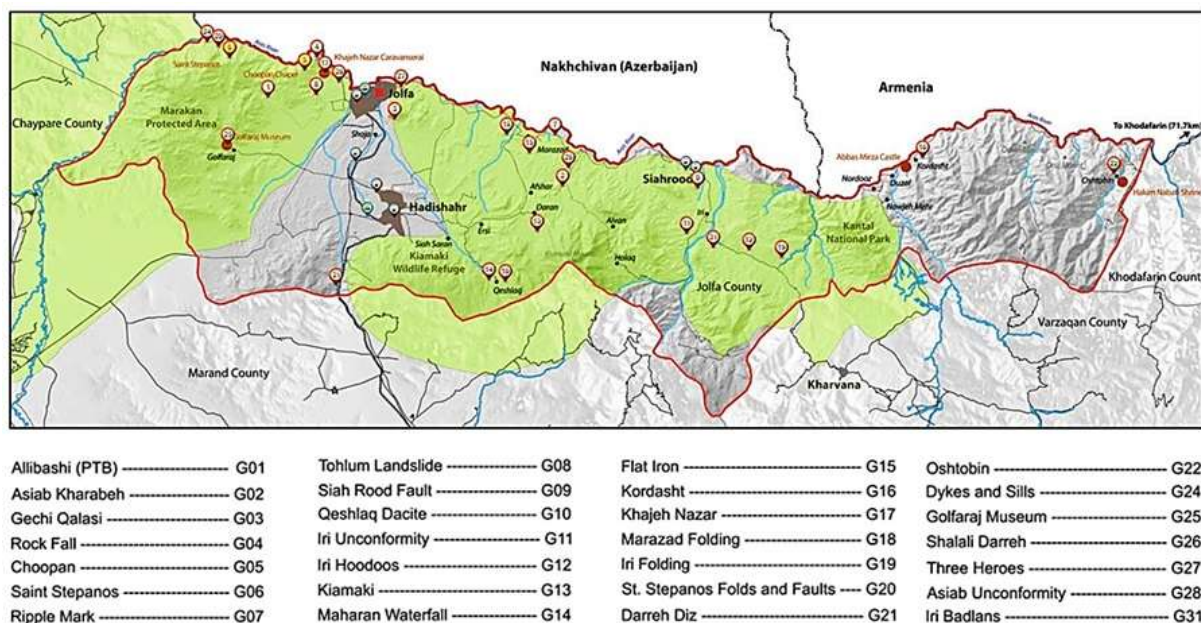


Figure 3. Geosites list of Aras UGGp (www.geoparkaras.com).

Aras UGGp also has a rich cultural heritage, including ancient settlements, traditional irrigation systems, Armenian monasteries, and evidence of continuous human adaptation to challenging environmental conditions spanning millennia. The protected areas of Kamtal, Marakan, Darediz, and Kiyamaki, managed by the Iranian Department of Environment, further enhance the restorative qualities of the landscape through their preserved natural settings, diverse flora and fauna, and opportunities for solitude and quiet contemplation.

The target population comprised Iranian domestic tourists who had completed at least one full visit to Aras UGGp within the twelve months preceding data collection, aged 18 years or older, able to read Persian, and having completed a visit lasting at least three hours.

Sampling Strategy and Data Collection: Given the absence of a comprehensive sampling frame for all Aras UGGp visitors, a systematic convenience sampling approach was implemented on-site. Trained research assistants stationed at three key exit points within the geopark invited every fifth adult tourist to participate immediately after completing their visit. Data collection took place from May to June 2025.

A total of 341 questionnaire responses were collected across both formats (paper = 148; online = 193). Following data screening procedures, including removal of incomplete questionnaires, straight-lining responses, and multivariate outliers, 288 valid responses were retained for analysis. An a priori sample size calculation using the SEM sample size calculator ([Soper 2025](#)) based on 24 observed indicators, 9 latent constructs, an anticipated medium effect size of 0.30, a desired statistical power of 0.80, and a significance level of 0.05 indicated a minimum required sample size of 256. The final sample of 288 valid observations exceeds this threshold.

Measurement Instrument: The questionnaire comprised four sections. The first section measured flow experience using eight items adapted from [Kim and Ko \(2019\)](#), capturing three dimensions: cognitive absorption (three items), time distortion (two items), and enjoyment (three items). The second section measured restorative experience using six items adapted from [Korpela et al. \(2008\)](#). The third section measured destination advocacy intention using ten items adapted from [Gupta and Singh \(2025\)](#), capturing three dimensions: destination defence (four items), destination information sharing (three items), and destination positivity (three items). The fourth section collected demographic and travel-related characteristics.

Minor wording modifications were made to contextualize items to Aras UGGp. All multi-item scales were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The original English scales were translated into Persian by a bilingual researcher, reviewed by two additional researchers, and verified through a back-translation procedure. A pilot test with 45 Persian-speaking visitors to Aras UGGp confirmed that all items were clearly understood. **Table 1** presents all constructs, dimensions, items, and their sources.

Data Analysis Strategy: Data analysis was conducted using SmartPLS 3.0 ([Ringle et al. 2022](#)) following a two-stage analytical procedure: assessment of the measurement model and evaluation of the structural model ([Hair et al. 2022](#)). SPSS version 28 was used for preliminary data screening and descriptive statistics.

The measurement model was evaluated for internal consistency reliability using composite reliability, Cronbach's alpha, and rho_A (threshold > 0.70), convergent validity through outer loadings (threshold > 0.70) and average variance extracted (threshold > 0.50), and discriminant validity using the Fornell-Larcker criterion. Variance inflation factors were examined to confirm the absence of multicollinearity ($VIF < 5.0$).

The structural model was evaluated by examining path coefficients and their significance using bootstrapping with 5,000 resamples. Explanatory power was assessed using R^2 values. Effect sizes were calculated using f^2 . Predictive relevance was evaluated using the blindfolding procedure ($Q^2 > 0$). For the mediation hypothesis, the indirect effect was computed using bootstrapping with 95% bias-corrected confidence intervals.

Descriptive Profile of the Sample: The final sample of 288 respondents comprised 46.5% male ($n = 134$) and 53.5% female ($n = 154$). Age distribution was as follows: 18–24 years (17.7%, $n = 51$), 25–34 years (35.4%, $n = 102$), 35–44 years (26.7%, $n = 77$), 45–54 years (11.8%, $n = 34$), and 55 years or older (8.4%, $n = 24$). In terms of educational attainment, 16.3% held a high school diploma or below ($n = 47$), 48.6% held a bachelor's degree ($n = 140$), 27.1% held a master's degree ($n = 78$), and 8.0% held a doctoral or professional degree ($n = 23$). Regarding travel frequency to Aras UGGp in the past year, 59.7% reported one visit ($n = 172$), 26.7% reported two visits ($n = 77$), and 13.6% reported three or more visits ($n = 39$). Travel companions included alone (17.4%, $n = 50$), with family (53.5%, $n = 154$), and with friends (29.1%, $n = 84$). **Table 2** presents the complete demographic characteristics of the sample.

Results

Prior to examining the structural relationships, the measurement model underwent rigorous evaluation of internal consistency reliability, convergent validity, and discriminant validity.

Assessment of the Measurement Model

Table 3 displays the psychometric properties of all multi-item constructs in the measurement model. Inspection of outer loadings revealed that all indicators exceeded the recommended threshold of 0.70, with values spanning from 0.71 to 0.84. Composite reliability values demonstrated strong internal consistency, ranging from 0.79 to 0.87, while Cronbach's alpha values fell within 0.73 to 0.82. Rho_A coefficients similarly surpassed the 0.70 benchmark. Average variance extracted values ranged from 0.58 to 0.65, each exceeding the 0.50 criterion, supporting convergent validity across all latent variables. For the second-order constructs, flow experience and destination advocacy intention, the repeated indicator approach was employed, with high loadings of first-order dimensions onto their respective second-order constructs (all > 0.73).

Discriminant validity was assessed through the Fornell-Larcker criterion. As reported in **Table 4**, the square root of AVE for each construct (presented in bold along the diagonal) exceeded its bivariate correlations with all other constructs, satisfying the Fornell-Larcker criterion. The strongest correlation was observed between flow experience and restorative experience ($r = 0.46$).

Evaluation of the Structural Model:

Following confirmation of measurement integrity, the structural model was estimated to test the proposed hypotheses. **Table 5** synthesizes the direct effect estimates. All three direct effect hypotheses received empirical support.

Flow experience exerted a significant positive influence on restorative experience (H1: $\beta = 0.46$, $t = 8.72$, $p < 0.001$, $f^2 = 0.27$), indicating that tourists who experience higher levels of flow report significantly greater restorative experiences. Restorative experience demonstrated a significant positive effect on destination advocacy intention (H2: $\beta = 0.38$, $t = 6.54$, $p < 0.001$, $f^2 = 0.18$), suggesting that tourists who perceive the geopark as restorative are more likely to engage in advocacy behaviors. The direct path from flow experience to destination advocacy

intention was also significant (H3: $\beta = 0.22$, $t = 3.91$, $p < 0.01$, $f^2 = 0.06$), indicating that flow influences advocacy intentions through both direct and indirect pathways.

Table 6 presents the explanatory power and predictive relevance of the model. The model accounted for substantial variance in the endogenous constructs. Restorative experience exhibited an R^2 of 0.21, indicating that flow experience explains 21% of its variance. Destination advocacy intention yielded an R^2 of 0.39, with flow experience and restorative experience collectively accounting for 39% of its variance. Predictive relevance was confirmed as all Q^2 values exceeded zero ($Q^2_{RE} = 0.12$, $Q^2_{DAI} = 0.24$).

Testing of the Indirect Effect

The mediation hypothesis (H4) proposing that restorative experience mediates the relationship between flow experience and destination advocacy intention was examined using bootstrapping. As reported in **Table 7**, the indirect effect was significant ($\beta = 0.17$, $SE = 0.03$, $t = 5.67$, $p < 0.001$, 95% CI [0.11, 0.23]). Given that the direct effect of flow experience on destination advocacy intention remained significant after inclusion of the mediator ($\beta = 0.22$, $p < 0.01$), these results indicate partial mediation. The variance accounted for was 36% (indirect effect 0.17 divided by total effect 0.47), suggesting that approximately one-third of the total effect of flow experience on destination advocacy intention transmits through restorative experience while the remaining two-thirds represents a direct pathway.

Table 8 provides a comprehensive summary of all hypothesis testing results. All four hypotheses (H1, H2, H3, H4) were supported.

Figure 4 presents the structural model results with path coefficients, significance levels, and R^2 values for the endogenous constructs.

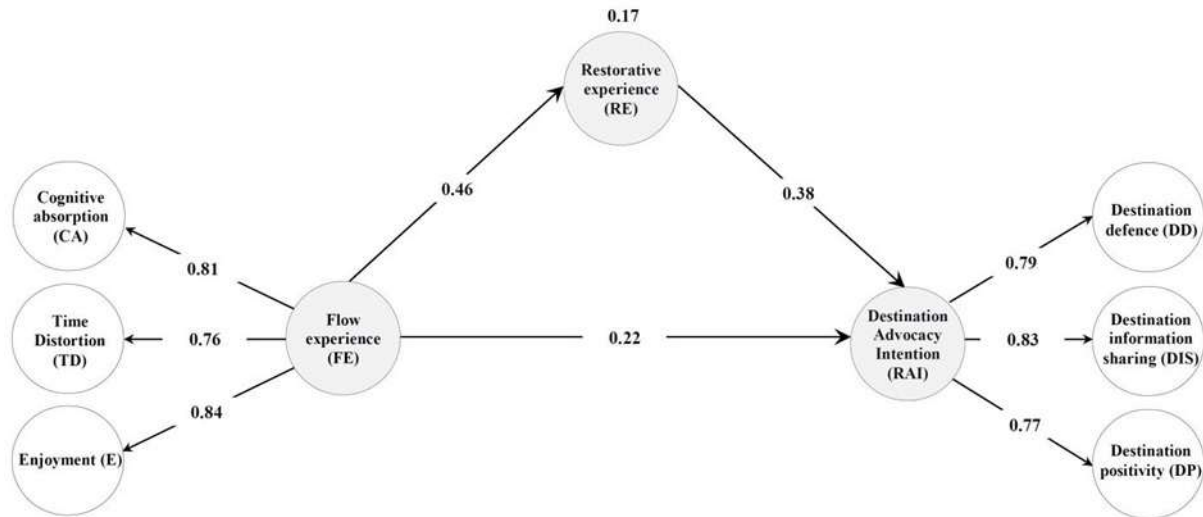


Figure 4. Structural model results with path coefficients.

Discussion

This study set out to investigate the psychological mechanisms through which flow experience influences tourists' destination advocacy intention in a cultural-natural landscape, with a particular focus on the mediating role of restorative experience. Grounded in the Stimulus-Organism-Response framework, the proposed conceptual model was empirically tested using PLS-SEM on data collected from 288 visitors to Aras UGGp in Iran. The empirical results provide robust support for all four hypotheses.

The significant positive effect of flow experience on restorative experience ($\beta = 0.46$) provides empirical support for conceptualizing flow as an antecedent of restorative perception. This finding extends Attention Restoration Theory by identifying flow as an important psychological mechanism associated with enhanced restorative perceptions. While Attention Restoration Theory traditionally focuses on environmental features as direct determinants of restoration (Lehto 2012; Zhai *et al.* 2025), the present study demonstrates that internal psychological states significantly influence how tourists perceive and experience restoration. Tourists who are deeply engaged and absorbed are more likely to experience the natural-cultural destination as restorative, suggesting that restoration is co-constructed through the interaction between environmental affordances and tourists' psychological states. In the context of Aras UGGp, the volcanic formations, river canyons, and cultural heritage sites provide rich opportunities for

flow-inducing activities. Tourists who become absorbed in these activities are more likely to perceive the environment as restorative.

The significant positive effect of restorative experience on destination advocacy intention ($\beta = 0.38$) extends Attention Restoration Theory into the behavioral domain. While Attention Restoration Theory has traditionally focused on the cognitive and psychological benefits of restoration (Kaplan 1995; Menardo *et al.* 2019), the present study demonstrates that restorative experiences translate into tangible behavioral outcomes. The theoretical mechanism underlying this relationship is grounded in positive psychology and reciprocity. Tourists who experience psychological restoration at a natural-cultural destination develop positive affect and gratitude, creating a psychological impetus to give back to the destination through advocacy behaviors, defending the destination against criticism, sharing positive information, and expressing favorable attitudes.

Critically, these findings carry significant implications for geoconservation theory. Destination advocacy intention, as operationalized in this study, extends beyond conventional tourism marketing outcomes such as positive word-of-mouth or revisit intention. When tourists actively defend a geopark against criticism, share information about its geological heritage, and express positive attitudes toward its natural and cultural assets, they are engaging in behaviors that directly support geoconservation objectives. Advocacy functions as a form of public support that can generate social pressure for the protection of vulnerable geosites, increase awareness of geological values among broader audiences, and foster a sense of shared responsibility for geoheritage stewardship (Gordon 2018; Pourfaraj *et al.* 2020). In this sense, the flow–restoration–advocacy pathway identified in this study suggests not merely a tourism psychology mechanism but a potential psychological foundation for geoconservation. Tourists who experience flow and restoration may be psychologically predisposed to become active agents of geoheritage protection, serving as informal ambassadors who disseminate knowledge about geological significance and advocate for the preservation of geosites. This aligns with the value-led management approach proposed by Shokripour *et al.* (2025), which emphasizes that conservation must be grounded in understanding the diverse values attributed to geological heritage by stakeholders. These values—scientific, aesthetic, cultural, ecological, educational, and economic—are ones that psychologically engaged tourists are particularly well-positioned to recognize and champion.

It is important to clarify the nature of the relationship between destination advocacy intention and geoconservation outcomes. The advocacy construct measured in this study captures tourists' willingness to defend the geopark against criticism, share positive information, and express favorable attitudes toward the destination. These behaviors do not constitute direct conservation actions such as volunteering, donating, or participating in site maintenance. Rather, they represent indirect contributions to geoconservation through several plausible pathways. First, positive word-of-mouth and information sharing increase public awareness of geological heritage values, expanding the constituency of citizens who recognize the significance of geosite protection. Second, public expressions of support and defense can generate social pressure on decision-makers to prioritize conservation over extractive or development-oriented land uses. Third, advocacy behaviors may foster a sense of personal investment in the destination that predisposes individuals toward more direct conservation-supportive actions in the future. While the empirical data in this study capture advocacy intentions rather than conservation behaviors per se, the theoretical linkage rests on the premise that a psychologically engaged and publicly supportive visitor base constitutes a necessary, though not sufficient, condition for long-term geoconservation success.

This insight bridges tourism psychology and geoconservation by suggesting that fostering positive psychological experiences may be not only beneficial for visitor satisfaction but is also relevant to the long-term protection of geological heritage. Furthermore, the finding that restorative experience partially mediates the flow–advocacy relationship suggests that the restorative qualities of geopark environments, tranquility, fascination, being away, and compatibility, are not incidental amenities but essential components of a psychological process that cultivates conservation-oriented behavioral intentions among visitors ([Ferdowsi 2025b](#); [Ranjbar Motalegh & Ferdowsi 2025](#)). [Tavana and Ferdowsi \(2024\)](#) have argued that the expansion of geotourism and geopark development contributes to geoheritage conservation through enhanced geological education and public awareness; the present findings extend this argument by identifying the specific psychological mechanisms through which geopark visitation generates conservation-supportive outcomes.

The significant direct effect of flow experience on destination advocacy intention ($\beta = 0.22$) demonstrates that flow influences advocacy beyond its indirect pathway through restoration. This finding is consistent with recent work by [Esmaili and Ferdowsi \(2026\)](#), who demonstrated that flow experience exerts both direct and indirect effects on behavioral intentions in nature-based tourism contexts. This holds whether flow is experienced directly on-site or vicariously

through digital influencer content, with destination image acting as an affective priming mechanism for immersive processing. The theoretical explanation for this direct pathway lies in the intrinsic characteristics of flow experience. Csikszentmihalyi (1990) emphasized that flow is an autotelic experience, intrinsically rewarding and enjoyable. Tourists who experience flow derive deep satisfaction and positive emotions directly from the experience itself, and these positive states naturally motivate sharing and advocacy.

The partial mediation finding (indirect effect $\beta = 0.17$, 36% VAF) reveals that while restorative experience transmits a portion of flow's effect onto advocacy intention, the majority of the total effect remains direct. This pattern suggests that flow experience influences destination advocacy intention through multiple parallel pathways rather than a single sequential chain, consistent with the S-O-R framework's allowance for both mediated and direct stimulus-response relationships (Mehrabian & Russell 1974; Xu *et al.* 2023).

Practical Implications: The findings offer several actionable implications for geopark managers. First, the significant effect of flow on restorative experience and advocacy suggests that managers should design experiences that facilitate flow states specifically within geological contexts. Geoparks should offer interpretive activities with an optimal balance between challenge and skill, such as guided geological walks, fossil identification activities, and interactive exhibits explaining volcanic or tectonic processes, that absorb visitors' attention and foster deep engagement with geological features. Davoodi Ilkhechi and Ferdowsi (2025) found that geological values, particularly scientific, aesthetic, and educational values, positively influence the quality of gamification programs at Aras UGGp, suggesting that game-based interpretive activities designed around these values can further enhance flow experiences among visitors.

Well-designed trails with clear interpretive signage, immediate feedback through interactive displays, and minimization of distractions such as overcrowding or noise pollution are essential for maintaining flow. Notably, Ferdowsi and Hosseinzadeh (2025) demonstrated that digital content marketing in geotourism can foster telepresence and flow experiences that positively influence tourists' behavioral intentions, suggesting that pre-visit digital engagement with geological content may prime visitors for deeper on-site flow states. When visitors enter flow states while learning about geological phenomena, they are not only more satisfied but also more likely to develop a personal connection to geoheritage that motivates protective attitudes. Hosseinzadeh and Ferdowsi (2024) further demonstrated that mental imagery, enhanced by

specialized digital content, indirectly strengthens behavioral intentions by amplifying flow experiences, indicating that pre-visit digital content strategy can serve as a preparatory mechanism for cultivating the psychological states that lead to advocacy.

Second, the significant effect of restorative experience on advocacy suggests that managers should prioritize the enhancement of restorative environmental qualities as a conservation strategy. Practical measures include preserving natural quiet zones within the geopark, providing comfortable rest areas with scenic views of significant geological formations, the careful spatial positioning of such facilities, informed by systematic site selection criteria such as those applied to ecotourism ecocamps (Ferdowsi 2025d), can ensure that restorative infrastructure is placed in optimal locations that maximize psychological benefits while minimizing ecological disturbance, designing trails that offer opportunities for solitude and reflection within the landscape, and managing visitor flows to prevent overcrowding that can undermine both restoration and the physical integrity of geosites. Interpretation can enhance restoration by facilitating soft fascination, using evocative language and narratives that engage visitors with the geological story of the landscape without demanding sustained directed attention. When tourists experience psychological restoration in the presence of spectacular geological features, they form emotional bonds that translate into willingness to defend and advocate for those features' protection.

Third, and most importantly for geoconservation, the demonstrated relationship between psychological experience and advocacy intentions suggests that managing visitor psychology is itself a geoconservation tool. Geopark managers can strategically design visitor experiences not only to maximize satisfaction but to cultivate a constituency of advocates who will support conservation initiatives, defend the geopark against threats from inappropriate development or extractive activities, and promote geological heritage appreciation within their social networks. Training programs for geo-guides should incorporate knowledge of flow and restoration concepts, equipping guides with practical techniques for facilitating immersive, restorative encounters with geological heritage. Guides trained in these principles can subtly structure interpretive experiences, adjusting pace, providing appropriate challenges, and creating space for quiet contemplation to optimize both psychological benefits for visitors and conservation outcomes for the geopark. In this way, visitor experience management becomes an integrated component of the geopark's broader geoconservation strategy, complementing the managerial, educational, and institutional approaches emphasized in existing Iranian geotourism research (Ferdowsi *et al.* 2025a; Ferdowsi & Németh 2026). More broadly, the model of geoheritage

conservation and vulnerability management proposed by Ferdowsi (2025a), which positions vulnerability reduction through management interventions as the core mechanism for achieving conservation at physical, functional, and visual levels, provides a macro-level framework within which the psychological strategies identified in the present study can be situated as complementary intervention tools. Furthermore, Ferdowsi (2025c) identified the Department of Environment, Ministry of Cultural Heritage, Tourism and Handicrafts, and Natural Resources and Watershed Management Organization as key first-level actors in Iranian geoheritage conservation, underscoring the need for geopark managers to coordinate advocacy-cultivation strategies with these institutional stakeholders to maximize conservation impact.

Conclusion

This study investigated the psychological mechanisms through which tourists' flow experience transforms into cultural-natural destination advocacy, with a particular focus on the mediating role of restorative experience. Grounded in the Stimulus-Organism-Response framework, a conceptual model was developed and empirically tested using PLS-SEM on data collected from 288 visitors to Aras UGGp in Iran. The findings demonstrate that flow experience serves as a psychological stimulus that directly and indirectly, through restorative experience, shapes destination advocacy intention. The results confirmed that flow experience significantly enhances restorative experience, restorative experience significantly influences destination advocacy intention, and flow experience directly affects destination advocacy intention. Furthermore, restorative experience partially mediated the relationship between flow experience and destination advocacy intention. The model explained 39% of the variance in destination advocacy intention and 21% of the variance in restorative experience.

The study makes several theoretical contributions. First, it extends the S-O-R framework to geoparks, demonstrating its applicability in explaining how environmental and psychological stimuli shape conservation-supportive behaviors. Second, it advances Attention Restoration Theory by identifying flow experience as a novel antecedent of restorative perception, suggesting that restoration is co-constructed through the interaction between environmental affordances and tourists' active psychological engagement. Third, and most significantly for geoconservation scholarship, this study identifies flow and restoration as psychological antecedents of destination advocacy intention, establishing a theoretical pathway through which positive visitor experiences translate into behaviors that support geological heritage protection.

By demonstrating that tourists who experience flow and restoration become more willing to defend, share information about, and speak positively of a geopark, this research provides empirical evidence that psychological experience management is a legitimate and potentially powerful geoconservation strategy. Advocacy intention, in this framework, is reconceptualized not merely as a marketing outcome but as a form of conservation citizenship, a psychological commitment that, while indirect in its conservation effects, can mobilize public awareness, strengthen social support for geoheritage protection, and complement institutional and managerial conservation efforts.

Several limitations of this study suggest avenues for future research. The study was conducted at a single UNESCO Global Geopark in Iran, so the findings may not generalize to other natural-cultural contexts; future research should replicate the model across diverse tourism sites. Additionally, economic conditions, which [Hosseinzadeh et al. \(2025\)](#) found to significantly influence digital marketing patterns and geotourism development at the county level in Mazandaran Province, may moderate the relationship between visitor experience and advocacy, warranting investigation in economically diverse settings. Furthermore, the specific cultural, social, religious, and political characteristics of Iran must be acknowledged as potential boundary conditions for the generalizability of these findings. The sample comprised exclusively domestic Iranian tourists, whose responses may be shaped by collectivist cultural values that emphasize social harmony and communal responsibility, potentially amplifying advocacy intentions relative to visitors from individualist cultures. Iran's unique economic-political conditions, including international sanctions, currency fluctuations, and restrictions on international travel, may also influence domestic tourists' relationship with national heritage sites, potentially intensifying place attachment and protective attitudes toward nationally significant destinations.

Additionally, [Karoubi and Ferdowsi \(2021\)](#) found that perceived social apathy among host communities negatively affects tourists' satisfaction, mental image, and behavioral intentions, suggesting that community engagement and local resident attitudes may serve as boundary conditions that either facilitate or inhibit the flow–restoration–advocacy pathway identified in the present study, and warrant examination in future geopark research. Moreover, an important potential trade-off warrants acknowledgement: while cultivating destination advocacy may support geoconservation through the mechanisms discussed, increased advocacy could paradoxically lead to higher visitation demand and greater pressure on sensitive geosites. The tension between promoting advocacy and managing visitor impacts represents a complexity

that geopark managers must navigate carefully, balancing the benefits of a supportive visitor constituency against the need to protect the very geoheritage that advocacy aims to conserve. Future research should examine this potential duality empirically. Future cross-cultural research comparing Iranian tourists with international visitors and with tourists in geoparks located in different cultural contexts is necessary to establish the external validity of the flow–restoration–advocacy model. The cross-sectional design restricts causal inference; longitudinal research and experimental designs are needed to establish temporal precedence. The reliance on self-reported measures introduces the possibility of common method bias; future research could complement self-reports with behavioral trace data or physiological measures. The sample was predominantly young to middle-aged and highly educated, limiting generalizability. The study did not examine potential moderators such as prior knowledge of heritage or frequency of nature exposure.

Finally, the restorative experience scale used was unidimensional; future research could employ multidimensional measures to examine which specific restorative components, being away, fascination, extent, or compatibility, most strongly mediate the flow-advocacy relationship. Furthermore, the development and validation of standardized scales for destination competitiveness and attractiveness in sport tourism contexts by [Moradi and Hossini \(2025\)](#) suggests an opportunity for parallel scale development specifically tailored to geotourism destinations, capturing the unique geological and cultural dimensions that distinguish geoparks from other tourism settings. Future studies should also examine how digital marketing strategies, which [Hosseinzadeh et al. \(2024\)](#) identified as influential in shaping geotourism economic policies at the local level, interact with on-site psychological experiences to jointly influence advocacy and conservation outcomes.

As UNESCO Global Geoparks and cultural-natural sites continue to attract growing numbers of visitors worldwide, understanding the psychological mechanisms through which these landscapes generate positive visitor outcomes becomes increasingly important for both conservation and sustainable tourism development. This study has provided evidence that flow experience serves as a psychological stimulus that is associated with destination advocacy both directly and through restorative experience, and that this advocacy may carry implications for geoconservation. By cultivating flow and restoration, geopark managers can nurture a constituency of psychologically engaged visitors whose advocacy supports the protection of geological heritage for future generations.

Conflict of interest

The authors declare no conflicts of interest.

Authors' Contributions

Zohreh Hasani: Conceptualization, Investigation, Data curation, Writing – original draft.

Bahram Yoosefi: Supervision, Methodology, Writing – review & editing, Project administration.

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Table 1. Constructs, dimensions, and items.

Constructs		Items
Restorative experience (RE) (Korpela <i>et al.</i> 2008)		RE1. I feel calmer after being in Aras UGGp.
		RE2. After visiting Aras UGGp, I always feel restored and relaxed.
		RE3. I get new enthusiasm and energy for my everyday routines from Aras UGGp.
		RE4. My concentration and alertness clearly increase in Aras UGGp.
		RE5. I can forget everyday worries in Aras UGGp.
		RE6. Visiting Aras UGGp is a way of clearing and clarifying my thoughts.
Destination Advocacy Intention (Gupta & Singh, 2025)	Destination defense (DD)	DD1. If I hear someone speaking negatively about Aras UGGp, I will defend it.
		DD2. I stand up for Aras UGGp when others talk negatively about it.
		DD3. I try to convince people to visit Aras UGGp's tourist places.
		DD4. I feel the need to defend Aras UGGp when it is criticized.
	Destination information sharing (DIS)	DIS1. I am willing to recommend Aras UGGp to others.
		DIS2. I usually say positive things about Aras UGGp on social media.
		DIS3. I will encourage my friends and relatives to visit Aras UGGp.
	Destination positivity (DP)	DP1. I say positive things about Aras UGGp.
		DP2. I speak favorably about the culture and natural heritage of Aras UGGp.

		DP3. I express my love for the tourist places of Aras UGGp.
Flow Experience (Kim & Ko 2019)	Cognitive Absorption (CA)	CA1. I was completely focused on my visit experience in Aras UGGp.
		CA2. I was deeply engrossed in the atmosphere of Aras UGGp.
		CA3. I was intensely absorbed by the environment of Aras UGGp.
	Time Distortion (TD)	TD1. I felt like time flew during my visit to Aras UGGp.
		TD2. Time seemed to go by very quickly in Aras UGGp.
	Enjoyment (E)	E1. Visiting Aras UGGp was enjoyable.
		E2. Visiting Aras UGGp was exciting.
		E3. Visiting Aras UGGp was fun.

Table 2. Demographic characteristics of the sample.

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	134	46.5
	Female	154	53.5
Age	18–24 years	51	17.7
	25–34 years	102	35.4
	35–44 years	77	26.7
	45–54 years	34	11.8
	55 years and older	24	8.4
Education	High school diploma or below	47	16.3
	Bachelor's degree	140	48.6
	Master's degree	78	27.1
	Doctoral or professional degree	23	8.0
Travel frequency to geoparks (past year)	One visit	172	59.7
	Two visits	77	26.7
	Three or more visits	39	13.6
Travel companions	Alone	50	17.4
	With family	154	53.5
	With friends	84	29.1

Table 3. Measurement model results: factor loadings, reliability, and validity.

Construct / Dimension / Item	Loading	CR	rho_A	Cronbach's α	AVE
Cognitive Absorption (CA)		0.84	0.82	0.77	0.64
CA1	0.79				
CA2	0.82				
CA3	0.80				
Time Distortion (TD)		0.80	0.78	0.74	0.67
TD1	0.82				
TD2	0.81				
Enjoyment (E)		0.86	0.84	0.80	0.61
E1	0.78				
E2	0.79				
E3	0.77				
E4	0.79				
Flow Experience (second-order)		0.88	0.86	0.82	0.65
CA → Flow	0.81				
TD → Flow	0.76				
E → Flow	0.84				
Restorative Experience (RE)		0.86	0.83	0.80	0.58
RE1	0.76				
RE2	0.78				
RE3	0.75				
RE4	0.74				
RE5	0.79				

RE6	0.76				
Destination Defense (DD)		0.83	0.81	0.77	0.62
DD1	0.79				
DD2	0.78				
DD3	0.77				
DD4	0.80				
Destination Information Sharing (DIS)		0.87	0.85	0.81	0.69
DIS1	0.84				
DIS2	0.81				
DIS3	0.84				
Destination Positivity (DP)		0.82	0.79	0.76	0.61
DP1	0.79				
DP2	0.77				
DP3	0.78				
Destination Advocacy Intention (second-order)		0.88	0.85	0.81	0.65
DD → DAI	0.79				
DIS → DAI	0.83				
DP → DAI	0.77				

Table 4. Discriminant validity: Fornell-Larcker criterion.

Construct	1	2	3	4	5	6	7
1. Cognitive Absorption	0.80						
2. Time Distortion	0.44	0.82					
3. Enjoyment	0.48	0.41	0.78				
4. Restorative Experience	0.42	0.38	0.46	0.76			
5. Destination Defense	0.36	0.31	0.40	0.44	0.79		
6. Destination Information Sharing	0.38	0.33	0.42	0.46	0.51	0.83	
7. Destination Positivity	0.34	0.29	0.38	0.41	0.47	0.49	0.78

Table 5. Structural model results: direct effects.

Hypothesis	Path	β	t-value	p-value	f ²	95% CI	Supported
H1	Flow Experience → Restorative Experience	0.46	8.72	<0.001	0.27	[0.36, 0.56]	Yes
H2	Restorative Experience → Destination Advocacy Intention	0.38	6.54	<0.001	0.18	[0.27, 0.49]	Yes
H3	Flow Experience → Destination Advocacy Intention	0.22	3.91	<0.01	0.06	[0.11, 0.33]	Yes

Table 6. Explanatory power and predictive relevance.

Endogenous Construct	R ²	Q ²	Interpretation
Restorative Experience	0.21	0.12	Moderate explanatory power
Destination Advocacy Intention	0.39	0.24	Moderate explanatory power

Table 7. Mediation analysis results (H4).

Path	Indirect Effect (β)	SE	t-value	p-value	95% CI Lower	95% CI Upper	Direct Effect (β)	Total Effect (β)	VAF	Mediation Type
Flow $\rightarrow$ RE $\rightarrow$ DAI	0.17	0.03	5.67	<0.001	0.11	0.23	0.22	0.47	36%	Partial

Table 8. Summary of hypotheses testing results.

Hypothesis	Path	β	Result
H1	Flow Experience $\rightarrow$ Restorative Experience	0.46***	Supported
H2	Restorative Experience $\rightarrow$ Destination Advocacy Intention	0.38***	Supported
H3	Flow Experience $\rightarrow$ Destination Advocacy Intention	0.22**	Supported
H4	Flow Experience $\rightarrow$ Restorative Experience $\rightarrow$ Destination Advocacy Intention	0.17***	Supported (Partial Mediation)

*** $p < 0.001$, ** $p < 0.01$