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How Does Mazu Festival Affect the Well-being of Elderly Tourists?An Empirical Study from the Perspective of Restorative Experience

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Article

Keywords: Perceived Restorative Environment, Place attachment、psychological recovery、Hedonic Well-being

Posted Date: November 1st, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10760302/v1

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Additional Declarations: No competing interests reported.

Abstract

Restorative environment research has predominantly focused on natural settings, with limited attention to short-duration, high-density folk festivals and elderly populations. Drawing upon the stimulus–organism–response (S-O-R) framework, this study integrates attention restoration theory and place attachment theory to construct a serial mediation model of “Perceived Restorative Environment through Place attachment and psychological recovery to Hedonic Well-being.” Using the Mazu Festival on Meizhou Island as the case site, a questionnaire survey was conducted among 552 elderly tourists aged 55 and above, and partial least squares structural equation modeling (PLS-SEM) was employed to test the hypotheses. The results indicate that Perceived Restorative Environment enhances Hedonic Well-being through dual mechanisms—a direct emotional gain pathway and a sequential cognitive–affective pathway via Place attachment and psychological recovery. Legibility exhibits robust explanatory power in the festival context. Short-term festival participation primarily yields attentional recovery, while deep psychological restoration is constrained by limited stay duration. At the theoretical level, this study proposes the “Dual-Pathway Model of Festival Restorative Experience,” extending the applicability of restorative environment theory from natural landscapes to cultural festival settings, and reveals how temporal constraints and cognitive aging shape the restoration pathways, thereby offering a new theoretical framework for understanding elderly well-being generation in culturally intensive tourism contexts. At the practical level, the findings provide concrete pathways for the age-friendly design of folk festival spaces and offer empirical support for transforming folk cultural tourism resources into public mental health intervention tools for the elderly, contributing to the improvement of active aging social service systems.

1. Introduction

The demand for psychological recovery among elderly tourists is steadily increasing. The proportion of China's population aged 60 and above has reached 18.9% (Li et al. 2026), and urbanization intensifies mental depletion, making psychological recovery a core travel motive (Lehto et al. 2016; Wang and Zhang 2026). The Mazu Festival, through its ritual ceremonies, provides a restorative context for elderly participants. However, empirical studies on restorative environments have predominantly focused on static natural settings such as forests and green spaces (Tyrväinen et al. 2014), with limited quantitative research on short-duration, high-density folk festivals (Dai and Tang 2023a). Moreover, existing research relies on mixed-age samples and fails to capture the distinctive characteristics of Perceived Restorative Environment among elderly tourists (Yoon et al. 2023; Li et al. 2026). Thus, current restorative environment research has yet to cover the contexts of folk festivals and elderly populations.

The core dimensions and transmission mechanisms of restorative environment theory have not been contextually tested in festival settings involving elderly participants(Kaplan, 1995).proposed a four-dimension framework, in which Extent emphasizes spatial scale and coherence; however, festival spaces are limited, challenging the explanatory power of Extent(Dai & Tang, 2023).Legibility has been identified as an independent dimension that may play a more critical role in high-density festivals, but no quantitative study has compared the predictive power of Extent and Legibility using elderly

samples(Hartig et al. 1997) Furthermore, existing studies have examined bivariate relationships between Perceived Restorative Environment, Place attachment, psychological recovery, and Hedonic Well-being (Yoon et al., 2023; Hao et al., 2026; Kim et al., 2026), yet none has established the full sequential pathway of “Perceived Restorative Environment through Place attachment and psychological recovery to Hedonic Well-being.” The restorative stages framework posits that psychological recovery consists of two progressive levels—attentional relaxation and deeper reflection—yet whether short-term festival participation can achieve full-process restoration remains empirically unanswered(Staats et al. 2003).

Drawing upon the S-O-R framework (Mehrabian and Russell 1974), this study integrates attention restoration theory(Kaplan & Kaplan, 1989), stress recovery theory(Ulrich 1983), and place attachment theory(Scannell and Gifford 2010) to construct a serial mediation model. Using elderly Mazu festival devotees as the research sample, this study addresses three research questions: First, in a festival context, does Legibility exhibit greater predictive power for restorative experience than Extent? Second, does Perceived Restorative Environment positively influence Hedonic Well-being through the sequential pathway of Place attachment and psychological recovery? Third, does short-term festival participation merely bring about attentional relaxation, or does it achieve multi-level psychological recovery? Through dimensional adaptation and full-chain mechanism testing, this study extends the applicability of restorative environment theory to cultural festivals and elderly populations.

2. Literature review and hypotheses

2.1 Theoretical background

The stimulus–organism–response (S-O-R) framework, originally developed in environmental psychology (Mehrabian and Russell 1974), posits that environmental features (stimuli) elicit internal psychological states (organisms), which in turn shape behavioral responses. This framework has been extensively applied in tourism and hospitality research to explain how physical and social environments influence consumers' cognitive, affective, and behavioral outcomes (Chen et al., 2017; Lehto, 2013; Wang & Zhang, 2026). In the S-O-R paradigm, the organism represents the intervening affective and cognitive states—such as pleasure, arousal, or attachment—that mediate the translation of environmental cues into approach or avoidance behaviors(Mehrabian and Russell 1974).

The present study adopts the S-O-R framework as the overarching theoretical architecture to model elderly tourists' restorative experience in a folk festival context. Specifically, the culturally rich and ritually immersive festival environment constitutes the stimulus (S); the sequential cognitive–affective processing—namely, place attachment as a primary organismic state and psychological recovery as a secondary organismic state—constitutes the organism (O); and hedonic well-being represents the ultimate response (R). This conceptualization extends prior S-O-R applications in two respects. First, whereas previous studies have predominantly operationalized the organism as parallel emotional states (e.g., pleasure and arousal) (Yang et al. 2025a), the present study decomposes the organism into temporally ordered stages, reflecting the progressive nature of psychological restoration (Staats et al. 2003). Second, by embedding attention restoration theory(Kaplan & Kaplan, 1989), stress recovery

theory(Ulrich 1983), and place attachment theory (Scannell and Gifford 2010) within the S-O-R architecture, this study offers a more nuanced account of the mechanisms through which festival environments generate well-being outcomes for elderly tourists. This integrated framework not only responds to calls for contextualizing restorative environment theory in culturally saturated settings (Dai & Tang, 2023) but also addresses the underexplored sequential logic underlying cognitive and affective restoration processes (Staats et al. 2003).

2.2 Perceived restorative environment in the festival context

Perceived restorative environment refers to an individual's subjective evaluation of an environment's restorative potential, a concept grounded in attention restoration theory (ART) and stress recovery theory (SRT). ART posits that sustained consumption of directed attention leads to cognitive fatigue, and that restorative environments enable recovery by evoking involuntary attention (Kaplan & Kaplan, 1989; Kim & Jeong, 2025). SRT contends that environments alleviate psychological stress by eliciting positive emotions and physiological relaxation (Ulrich 1983; Liu et al. 2020; Li et al. 2026). Perceived restorative environment thus arises from the interaction between environmental characteristics and individual needs, rather than being determined solely by physical attributes (Hartig et al. 1997; Ivarsson and Hagerhall 2008; Tyrväinen et al. 2014; Wang and Zhang 2026).A four-dimension framework—Being away, Fascination, Extent, and Compatibility—has been proposed to characterize such restorative environments (Kaplan, 1995; Hao et al., 2026). Extent encompasses coherence and scope, referring to an environment's sufficient space and orderly structure that support sustained mental activity (Hartig et al. 1997; Li et al. 2026).
At the measurement level, however, scholarly opinions diverge. The Perceived Restorativeness Scale (PRS) was developed to include Legibility as an independent dimension, defined as the ease with which individuals can understand and navigate an environment (Hartig et al. 1997; Jeong 2024). In Kaplan's original framework, Legibility is subsumed under the coherence component of Extent, whereas it is argued that in complex environments, Legibility operates as a cognitive indicator independent of environmental scale (Hartig et al., 1997; Ivarsson & Hagerhall, 2008; Kim & Jeong, 2025). This divergence provides a theoretical rationale for contextualized dimensional adaptation.

In tourism research, a six-dimension scale comprising Compatibility, Extent, Mental Being away, Physical Being away, Fascination, and Incongruence was developed (Lehto, 2013). This scale was subsequently tested with a sample of Chinese tourists; unsatisfactory reliability for the Incongruence dimension led to its removal, forming a five-dimension structure (Compatibility, Extent, Mental Being away, Physical Being away, Fascination) that has received subsequent empirical support (Chen et al. 2017; Wang and Zhang 2026). Existing studies have mostly retained Extent, with limited exploration of Legibility's role in cultural settings. In high-density folk festivals, spatial vastness is not a core element; instead, visitors require clear interpretation of spatial order and cultural symbols (Dai & Tang, 2023).

The present study, focusing on elderly tourists at the Mazu Festival, excludes the Extent dimension. Elderly tourists possess limited cognitive bandwidth and greater sensitivity to crowded environments,

making their restorative experience more dependent on environmental comprehensibility than on spatial vastness (Hao et al. 2026). Accordingly, this study adopts the approach of treating Legibility as an independent dimension while retaining Compatibility to capture the alignment between the festival atmosphere and elderly tourists‘ religious and leisure needs (Hartig et al. 1997). This operationalization addresses two research gaps: the complexity of festival environments and the perceptual specificity of elderly tourists.

2.3 From stimulus to primary organism: the effect of PRE on place attachment

Place attachment refers to the emotional bond and psychological connection that individuals develop with specific places (Hidalgo and Hernandez 2001; Lewicka 2011; Scannell and Gifford 2017). It is essentially a person–place bond grounded in perception, cognition, and practice (Gieryn 2000; Yan et al. 2026). A tripartite person–process–place (PPP) framework has been proposed, suggesting that place attachment is formed through multiple psychological processes involving affect, cognition, and behavior, and varies across spatial scales and place characteristics (Scannell and Gifford 2010; Boley et al. 2021; Wang and Zhang 2026). Unlike short-term environmental preferences, place attachment is a stable psychological structure accumulated through repeated contact and positive experiences (Manzo 2005; Habachi et al. 2024; Li et al. 2026).

Place attachment is typically operationalized as two dimensions: place dependence and place identity (Williams and Vaske 2003; Kyle et al. 2004). Place dependence refers to functional attachment, wherein individuals rely on a place because it provides the physical conditions to meet their specific activity needs (Kelly. Bricker, Deborah. Kerste, 2000; van Riper et al., 2019; Yoon et al., 2023). Place identity refers to the emotional and symbolic dimension, wherein individuals incorporate the place into their self-concept, deriving a sense of belonging, self-esteem, and meaning in life (Proshansky 1983; Williams and Vaske 2003; Lewicka 2011; Ratcliffe and Korpela 2016). These two dimensions correspond to functional and affective bonds, both rooted in individuals‘ cognitive, emotional, and behavioral systems (Williams and Vaske 2003; Zhou et al. 2024).

In the Mazu Festival context, the connotation and weighting of these two dimensions differ from those in stable natural recreation areas. Place dependence is shaped not by long-term facility availability but by the accessibility of ritual participation and perceived physical and psychological safety (Li et al. 2026). Place identity is driven less by landscape aesthetics and more by cultural resonance, collective belief, and intergenerational transmission of Mazu devotion (Habachi et al. 2024). For elderly tourists, attachment formation exhibits proactive construction: rather than passively adapting to the environment, healthy older adults actively connect personal life experiences with the place through activity participation and interpersonal relationships, thereby maintaining social roles and reinforcing self-identity (Lewicka 2011; Buffel et al. 2012; Li et al. 2026).

A festival environment characterized by Being away, Fascination, Compatibility, and Legibility constitutes a setting with low cognitive load and sustained positive emotional arousal. According to ART (Kaplan and Kaplan 1989) and SRT (Ulrich 1983), such settings, through conditioned association, consolidate

repeatedly experienced relaxation and tranquility into person–place bonds. For elderly tourists, Legibility reduces cognitive burden and enhances perceived safety, accelerating the transformation from environmental evaluation to emotional attachment. The PPP framework indicates that sustained positive experiences and personal meaning-making are key to the formation of person–place emotional bonds (Manzo 2005; Scannell and Gifford 2010). Empirical evidence supports this logic: a meta-analysis has reported an overall effect size of $r = 0.591$ ($p < 0.001$) between perceived restorativeness and place attachment (Hao et al. 2026); and it has been demonstrated that perceived restorativeness positively predicts place identity and place dependence (Yoon et al. 2023). Accordingly, this study proposes:

H1.Perceived restorative environment significantly positively influences place attachment.

2.4 From primary to secondary organism: the pathway from place attachment to psychological recovery

Psychological recovery refers to the dynamic process through which individuals, after experiencing cognitive fatigue or stress, replenish depleted psychological resources and restore psychological functioning to a stable state through contact with environments possessing restorative characteristics (Kaplan 1995; Hartig et al. 1997). This concept is rooted in environmental psychology research on stress responses and adaptation mechanisms, and its core lies in explaining how environments alleviate negative emotions such as anxiety and irritability and promote cognitive function restoration through specific psychological pathways (Ulrich et al. 1991; Hartig et al. 2003).
The internal structure of psychological recovery involves two theoretical perspectives. The first is the cognitive restoration perspective based on ART. The core of psychological recovery lies in restoring directed attention (Kaplan 1995).The sustained consumption of directed attention by daily affairs induces cognitive fatigue, and environments characterized by Being away, Fascination, Extent, and Compatibility allow inhibited cognitive mechanisms to rest by activating involuntary attention (Kaplan and Kaplan 1989). This process has been categorized as attentional restoration (Herzog et al. 1997). The second is the emotional restoration perspective based on SRT. Suitable environments can directly evoke positive emotions, interrupt persistent negative thought cycles, and alleviate psychological stress (Ulrich 1983). SRT emphasizes emotional and physiological recovery, contending that the key to restoration lies in the positive affective responses elicited by the environment and their buffering effects on stress (Ulrich et al. 1991). A complete psychological recovery process simultaneously involves cognitive function restoration and emotional stress relief (Hartig et al. 2003; Staats et al. 2003).In tourism research, psychological recovery has become an important indicator for evaluating destination experience quality (Lehto 2013; Chen et al. 2017). Research indicates that rich environmental experiences enhance tourists' restoration levels (Eder and Arnberger 2012; Liu et al. 2020), and festival events can strengthen individuals' restorative perceptions by creating positive memories (Habachi et al. 2024).

After forming an emotional bond with the festival place, elderly tourists acquire a psychological secure base (Raymond et al. 2010; Zhou et al. 2024). Place dependence ensures the accessibility of ritual participation and physical and psychological safety, while place identity, grounded in family memories and Mazu belief, shapes self-continuity (Scannell and Gifford 2010). According to cognitive appraisal

theory, the sense of security and control derived from attachment alters individuals' threat appraisal of stressors, thereby reducing psychological stress levels (Li et al. 2026). The predictive effect of place identity on restorative outcomes has been reported to be higher than that of place dependence(Liu et al. 2020). Empirical evidence further confirms that place attachment positively predicts psychological recovery in tourism and recreation settings (Li et al. 2026). Accordingly, this study proposes:

H2. Place attachment significantly positively influences psychological recovery.

2.5 The generation of response: hedonic well-being and its multiple antecedents

Hedonic well-being traces its theoretical origin to the ancient Greek hedonic tradition, which holds that the ultimate goal of life is to maximize pleasurable experiences and avoid pain (Vada et al. 2020). Modern positive psychology centers on the attainment of positive affect and the avoidance of negative affect, complementing eudaimonic well-being, which focuses on life meaning and the realization of personal potential (Ahn et al. 2019; Azimi et al. 2025). As the core affective dimension of subjective well-being, hedonic well-being is primarily determined by the relative intensity of positive and negative affects, with life satisfaction existing as an independent cognitive dimension alongside it(Diener et al. 1985).
In tourism research, hedonic well-being is defined as the predominantly positive affect-driven enhancement of subjective well-being that tourists develop through destination experiences, manifested in the abundance of positive emotions such as pleasure and contentment and the diminishment of negative emotions (Vada et al. 2019; Fan et al. 2023). This definition emphasizes the central role of affective experience and considers satisfaction with a specific tourism context as its cognitive antecedent or accompanying state (Voigt et al. 2010; Ahn et al. 2019; Fan et al. 2023). It has been further clarified that hedonic well-being stems from individuals' approach toward pleasure goals and avoidance of unpleasant experiences (Teichmann et al. 2026). At the measurement level, experienced pleasure has been operationalized as an individual's positive affective state within an environment, typically assessed using semantic differential dimensions such as happy–sad, pleasant–annoyed, satisfied–dissatisfied, and fulfilled–bored (Pals et al. 2009).

Hedonic well-being is regarded as a core outcome variable of tourism experience (Hwang and Lee 2019; Fan et al. 2024). Tourism satisfaction, as an immediate cognitive response to a specific experience, serves as an important indicator of hedonic well-being (Chen et al., 2016; Kim et al., 2026). The Mazu Festival, characterized by high-density cultural symbols and intense emotional involvement, provides a rich setting for examining the formation pathway of hedonic well-being among elderly tourists(Dai and Tang 2023a).

Three pathways link the antecedents to hedonic well-being. First, psychological recovery serves as a crucial link to well-being outcomes. The broaden-and-build theory suggests that the positive inner states generated by psychological recovery—such as mental clarity, inner peace, and subjective vitality—broaden cognitive scope and build enduring psychological resources such as resilience and social connectedness (Fredrickson 2001). After elderly tourists complete cognitive and emotional restoration, the accumulated

positive emotions translate into positive evaluations of the festival experience, thereby enhancing hedonic well-being (Lee et al. 2025; Kim et al. 2026). It has been confirmed that positive experiences related to psychological recovery positively predict well-being indicators (Si et al. 2024). Accordingly, this study proposes:

H3.Psychological recovery significantly positively influences hedonic well-being.

Second, perceived restorative environment can directly affect hedonic well-being. At the cognitive level, ART suggests that restorative environments alleviate cognitive depletion and foster positive cognitive appraisals; at the emotional level, SRT suggests that environments can directly evoke positive emotions and inhibit negative thought cycles (Ulrich et al. 1991; Kaplan 1995). The Mazu Festival, combining spiritual sustenance and ritual experience, strengthens this direct pathway ((Azimi et al. 2025). This direct effect was reported with $\beta = 0.547$ ($p < 0.001$) (Lee et al. 2025); and it has been confirmed that destination restorative perception positively predicts quality of life (Si et al. 2024). Accordingly, this study proposes:

H4.Perceived restorative environment significantly positively influences hedonic well-being.

Third, place attachment directly predicts hedonic well-being. The sense of security and belonging generated by place attachment constitutes positive psychological benefits that are highly consistent with the connotation of hedonic well-being (Scannell and Gifford 2017). For elderly tourists, place attachment provides stable social connections and emotional bonding, fulfilling needs for spiritual solace and cultural identity, and generating positive experiences such as pleasure and contentment. Empirical evidence supports a positive relationship between place attachment and well-being (Li et al. 2026). Place emotional bonding among elderly populations has been found to be associated with better health outcomes (Sieng and Szabó 2023). Accordingly, this study proposes:

H6. Place attachment significantly positively influences hedonic well-being.

The direct effect of perceived restorative environment on psychological recovery (H5) will be presented in the sequential mediation section (2.6) to maintain logical coherence with the full chain.

2.6 The sequential mediation pathway and theoretical framework

In addition to the direct pathways articulated above, the full model entails a core serial mediation pathway that aligns with the S-O-R framework and the cognitive-affective progressive processing logic (Staats et al. 2003; Fan et al. 2023). Environmental cognitive appraisal first settles into emotional bonding, then psychological restoration is achieved based on emotional security, and finally well-being evaluation is generated.

Perceived restorative environment directly influences psychological recovery. ART and SRT provide the theoretical foundation for this pathway (Ulrich, 1983; Kaplan & Kaplan, 1989). The festival environment

with four restorative qualities alleviates directed attention depletion through involuntary attention to achieve cognitive restoration, while simultaneously evoking positive emotions through the ritual atmosphere to interrupt negative thought cycles (Kim and Jeong 2025; Zhao et al. 2025). Prior studies have demonstrated significant positive effects of perceived restorative environment on psychological recovery (Lee et al. 2025; Li et al. 2026). Accordingly, this study proposes:

H5.Perceived restorative environment significantly positively influences psychological recovery.

The complete sequential pathway—perceived restorative environment → place attachment → psychological recovery → hedonic well-being—captures the full chain from environmental stimulus to well-being response. The restorative stages framework posits that psychological recovery comprises two progressive levels: attentional relaxation and deeper reflective restoration (Staats et al. 2003). Short-term festival participation may primarily trigger the earlier stage of attentional recovery, while deeper reflective restoration may be constrained by limited stay duration and the transient nature of festival events. The sequential logic is supported by prior empirical evidence: a significant indirect effect of perceived restoration through place attachment to well-being has been verified (Li et al. 2026); and similar serial transmission logic has been validated in natural and tourism settings (Si et al. 2024; Zhao et al. 2025). Thus, the theoretical pathway progresses from environmental perception (stimulus), through emotional bonding and psychological restoration (sequential organisms), to well-being evaluation (response). Accordingly, this study proposes:

H7.Place attachment and psychological recovery play a serial mediating role between perceived restorative environment and hedonic well-being (perceived restorative environment → place attachment → psychological recovery → hedonic well-being).

he theoretical framework guiding this study is illustrated in Fig. 1. The framework positions the perceived restorative environment (comprising Being away, Fascination, Compatibility, and Legibility) as the stimulus (S), place attachment and psychological recovery as the primary and secondary organismic states (O), and hedonic well-being as the response (R). The model specifies seven hypotheses, with H1–H6 capturing direct effects and H7 capturing the full sequential mediation pathway.

3. Methodology

3.1. Study site: Meizhou Island and the Mazu Festival

Meizhou Island in Putian City, Fujian Province, was selected as the case site for two reasons: its central position within the Mazu cultural system and the close alignment between its festival characteristics and the research topics. Meizhou Island is the birthplace and ascension site of Mazu (Lin Mo) and the ancestral home of over ten thousand Mazu temples worldwide, bearing the original cultural essence of Mazu belief (Allio 2014). In 2009, the Mazu belief and customs centered on Meizhou Island were inscribed on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity (Yao et al.

2020), establishing the island as a cultural landmark of international significance that consistently attracts devotees and tourists from more than fifty countries and regions.

Meizhou Island is a national 5A-level scenic area, where sacred ritual space and tourism space converge. The periodically held Mazu Cultural Tourism Festival, grounded in cultural practices such as sacrificial rites and pilgrimages, serves both spiritual solace and psychological recovery functions, corresponding directly to the focal issues of this study—perceived restorative environment, place attachment, and psychological recovery. The island hosts cultural venues including the Mazu Ancestral Temple, Tianfei Hometown Park, and the Mazu Culture Exhibition Hall, providing tourists with diverse cultural experiences (Wang et al., 2026). In summary, Meizhou Island offers an appropriate setting for investigating the psychological serial transformation mechanism of elderly tourists in a folk festival context.

3.2 Survey instrument

All measurement items were adapted from established instruments in tourism and environmental psychology research, with wording adjusted to fit the specific context of the Mazu Festival on Meizhou Island. Items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire also included six demographic items (gender, age, education, monthly disposable income, employment status, and residential area type) and two Mazu Festival-specific background items (travel companion and prior visits).

Perceived restorative environment was operationalized as a second-order construct comprising four first-order dimensions—Being away, Fascination, Compatibility, and Legibility—measured by 13 items, with items adapted from prior research (Nordh et al. 2017; Jeong 2024). Place attachment was operationalized as a second-order construct comprising two first-order dimensions—Place Dependence and Place Identity—measured by six items, with items adapted from prior research (Palau-Saumell et al. 2019; Habachi et al. 2024). Psychological recovery was measured by seven items, with items adapted from prior research (Tyrväinen et al. 2014; Si et al. 2024). Hedonic well-being was measured by five items, with items adapted from prior research (Diener et al. 1985; Vada et al. 2019; Fan et al. 2023). All scales demonstrated satisfactory reliability and validity in prior research. All measurement items are presented in Table 3.

3.3 Data collection

Data were collected through a questionnaire survey conducted from May to July 2026 at core visitor nodes on Meizhou Island (the Mazu Ancestral Temple, the ferry terminal, and the coastal viewing platform). As a complete sampling frame for Mazu Festival tourists was unavailable, convenience sampling was adopted—a method widely used in tourism field research (Mason et al. 2010; Luekveerawattana et al. 2025). To broaden the sample composition and mitigate sampling bias, the survey covered weekdays, weekends, the Mazu Birthday Celebration (the 23rd day of the third lunar month), and the Straits Forum Mazu Cultural Activity Week, encompassing both peak and off-peak pilgrimage periods. All respondents were aged 55 or above.

A total of 600 questionnaires were distributed, and 570 were returned. After excluding responses with incomplete answers, straight-lining, or excessively short completion times, 18 invalid responses were removed, yielding 552 valid questionnaires for analysis. The effective response rate was 92.0%. This sample size satisfies the statistical power requirements for PLS-SEM models containing higher-order constructs (Hair et al. 2019).

Table 1 summarizes the demographic characteristics of the valid sample. The sample comprised 55.4% female and 44.6% male respondents. The age distribution was concentrated in the 55–74 age group (95.7% combined), with those aged 75 and above accounting for 4.3%. In terms of education, the largest proportions had completed junior high school (36.6%) and senior high school or vocational school (27.5%). Monthly disposable income was concentrated in the range of RMB 5,001–8,000 (37.0%). Retired individuals constituted 67.8% of the sample. Regarding residential area, 42.8% resided in prefecture-level cities or above, while 27.5% lived in townships or rural villages. Only 7.8% of respondents traveled alone. Repeat visitors accounted for 87.1%, among whom 41.7% had visited four or more times.

This study conducted a common method variance (CMV) test (Podsakoff et al. 2003). In Harman's single-factor analysis, the first common factor explained 35.506% of the total variance, falling below the 50% threshold. To address the limited robustness of the single Harman test (Howard et al. 2024), this study further adopted the marker variable method for re-examination (Hair et al. 2019). After incorporating the marker variable, the R^2 values of Place attachment, psychological recovery, and Hedonic Well-being showed no substantial fluctuations, and the marker variable had no significant direct effect on any of these endogenous constructs ($p > 0.05$). Taken together, the results of both tests indicate that serious common method variance is not a concern in this study (see Table 2).

Table 1
Respondents' demographics (N = 552)

Demographic factor	Category	Frequency	Percentage(%)
Gender	Male	246	44.6
	Female	306	55.4
Age	55–64 years(young-old)	260	47.1
	65–74 years	268	48.6
	≥ 75 years	24	4.3
Education	Primary school or below	113	20.5
	Junior high school	202	36.6
	Senior high school / Vocational school	152	27.5
	Junior college	57	10.3
	Bachelor's degree or above	28	5.1
Monthly disposable income	≤ 3,000 RMB	44	8
	3,001–5,000 RMB	169	30.6
	5,001–8,000 RMB	204	37
	8,001–12,000 RMB	81	14.7
	> 12,000 RMB	54	9.8
Employment status	Fully retired	374	67.8
	Still employed	88	15.9
	Semi-retired / Part-time	90	16.3
Residential area	Prefecture-level city or above	236	42.8
	County city	164	29.7
	Township / Rural village	152	27.5
Travel companion	Alone	43	7.8
	Spouse only	99	17.9
	Family (children/grandchildren)	94	17
	Friends / Fellow townsfolk	114	20.7

Note. Income in Chinese Yuan (RMB). "Young-old" follows gerontological conventions for adults aged 55–64.

Demographic factor	Category	Frequency	Percentage(%)
	Tour group	202	36.6
Prior visits	First visit	71	12.9
	2–3 times	251	45.5
	≥ 4 times	230	41.7
Note. Income in Chinese Yuan (RMB). "Young-old" follows gerontological conventions for adults aged 55–64.			

Common Method Variance Testing

This study conducted a common method variance (CMV) test (Podsakoff et al. 2003). In Harman's single-factor analysis, the first common factor explained 35.506% of the total variance, falling below the 50% threshold. To address the limited robustness of the single Harman test (Howard et al. 2024), this study further adopted the marker variable method for re-examination (Hair et al. 2019). After incorporating the marker variable, the R^2 values of Place attachment, psychological recovery, and Hedonic Well-being showed no substantial fluctuations, and the marker variable had no significant direct effect on any of these endogenous constructs ($p > 0.05$). Taken together, the results of both tests indicate that serious common method variance is not a concern in this study (see Table 2)

Table 2
Common method variance testing using marker variable (N = 552).

Endogenous variable	R^2 without MV	R^2 with MV
Place attachment	0.136	0.148
Psychological recovery	0.348	0.348
Hedonic Well-being	0.493	0.494

3.4 Analytical approach

Covariance and variance (Henseler et al. 2009) are commonly considered when carrying out SEM. The variance approach, otherwise known as partial least squares-SEM (PLS-SEM), was selected for two reasons. First, this study sought to predict hedonic well-being as the key target endogenous construct. PLS-SEM requires the evaluation of a measurement model and a structural model for hypothesis testing (Hair et al. 2019; Hair et al. 2021). Second, PLS-SEM is a non-parametric method (Hair et al. 2019) and was considered the most appropriate for statistical analysis.

Following established guidelines (Hair et al. 2019), a two-stage analytical procedure was adopted. In the first stage, the measurement model was assessed for reliability, convergent validity, and discriminant validity. Reliability was evaluated using Cronbach's alpha and composite reliability (CR), with thresholds of 0.70. Convergent validity was assessed through average variance extracted (AVE), requiring values above 0.50, and item loadings above 0.70. Discriminant validity was examined using the heterotrait-

monotrait (HTMT) ratio, with values below 0.85 indicating satisfactory discriminant validity (Henseler et al. 2016). For second-order constructs, the repeated indicators approach was applied (Hair et al. 2019).

In the second stage, the structural model was evaluated to test the hypothesized relationships. Path coefficients, t-values, and bias-corrected bootstrap confidence intervals were computed using 5,000 bootstrap resamples (Hair et al. 2019). Model explanatory power was assessed via R^2 values, and predictive relevance via Stone-Geisser's Q^2 (Hair et al. 2019). The significance of indirect effects was examined to test the sequential mediation hypothesis (H7).

4. Results

4.1 Measurement model assessment

Following the criteria of (Hair et al., 2019), this study assessed the measurement model in terms of reliability, convergent validity, and discriminant validity. The standardized factor loadings of all first-order constructs exceeded 0.70, and Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) all surpassed the recommended thresholds(Fornell and Larcker 1981) (see Table 3). Perceived Restorative Environment and Place attachment were specified as second-order constructs and modeled using the repeated indicator approach (Hair et al. 2019) (see Table 4). The loadings of the first-order dimensions were acceptable, and the CR and AVE of the two second-order constructs both reached satisfactory levels. The heterotrait-monotrait ratio (HTMT) test results showed that all construct pair values were below 0.85 (Henseler et al. 2016) (see Table 5). Taken together, the measurement model demonstrated satisfactory reliability, convergent validity, and discriminant validity.

Table 3
Measurement Model Assessment (N = 552).

First-order constructs, items, and source	Mean	Loading	Weights	α	CR	AVE
Being away				0.776	0.870	0.690
Ba1:Being at the Mazu Festival on Meizhou Island makes me feel like I have escaped my boring life.	3.76	0.851	0.409			
Ba2:Being at the Mazu Festival on Meizhou Island makes me feel like I have left everything behind and gone somewhere else.	3.76	0.830	0.397			
Ba3:The Mazu Festival on Meizhou Island gives my brain a break from everyday life.	3.67	0.811	0.397			
Fascination				0.782	0.873	0.696
Fa1:I find the Mazu Festival on Meizhou Island fascinating.	3.96	0.827	0.410			
Fa2:The Mazu Festival on Meizhou Island ignites my curiosity.	3.86	0.853	0.395			
Fa3:There is much to explore and discover at the Mazu Festival on Meizhou Island.	3.73	0.824	0.394			
Compatibility				0.86	0.905	0.705
Co1:I want to spend more time at the Mazu Festival on Meizhou Island.	3.88	0.831	0.292			
Co2:Being at the Mazu Festival on Meizhou Island suits my personality or preferences.	3.86	0.850	0.311			
Co3:I feel like I can do the things I want to do at the Mazu Festival on Meizhou Island.	3.77	0.826	0.287			
Co4:I can have a good time at the Mazu Festival on Meizhou Island.	3.89	0.849	0.302			
Legibility						
Le1:The Mazu Festival on Meizhou Island is easy to navigate.	3.59	0.847	0.407			
Le2:The organization of the Mazu Festival on Meizhou Island is easy to understand.	3.57	0.816	0.387			
Le3:I can mentally visualize the structure of the Mazu Festival on Meizhou Island.	3.64	0.839	0.405			
Place dependence				0.766	0.865	0.681

First-order constructs, items, and source	Mean	Loading	Weights	α	CR	AVE
Pd1:No other place can substitute the Mazu Festival on Meizhou Island.	3.67	0.809	0.394			
Pd2:Meizhou Island is the best place to experience Mazu culture and festivals.	3.61	0.859	0.426			
Pd3:The Mazu Festival offers rich cultural activities and festival atmospheres.	3.62	0.807	0.390			
Place identity				0.751	0.858	0.668
Pi1:I strongly identify with the Mazu Festival on Meizhou Island.	3.81	0.816	0.414			
Pi2:I feel proud to share my experience of the Mazu Festival with others.	3.97	0.825	0.401			
Pi3:To visit the Mazu Festival on Meizhou Island says a lot about who I am.	3.86	0.810	0.409			
Psychological recovery				0.856	0.890	0.536
Pr1:After this trip, I was able to recover and relax my body and mind.	3.91	0.720	0.182			
Pr2:After this trip, I have rekindled my enthusiasm and vigor for life.	3.95	0.727	0.203			
Pr3:After this trip, I became more peaceful.	3.92	0.729	0.192			
Pr4:After this trip, I can concentrate better.	3.96	0.768	0.196			
Pr5:After this trip, I became more quick-witted.	3.89	0.724	0.190			
Pr6:During this trip, I can forget my daily worries.	3.93	0.748	0.200			
Pr7:Traveling is a way for me to cleanse and purify my soul.	3.99	0.708	0.204			
Hedonic Well-being				0.818	0.873	0.579
Hw1:In most ways, this Mazu Cultural Festival trip is close to ideal.	3.96	0.731	0.255			
Hw2:The conditions on this Mazu Cultural Festival trip are excellent.	3.98	0.743	0.263			
Hw3:I am satisfied with this Mazu Cultural Festival trip.	4.03	0.787	0.288			
Hw4:I achieve the most important things on this trip.	4.04	0.731	0.247			

First-order constructs, items, and source	Mean	Loading	Weights	α	CR	AVE
Hw5:I will not change the plans I have made for this trip.	4.03	0.811	0.260			

Table 4
Second-order reflective constructs (N = 552).

Second-order constructs	Code	Loading	α	CR	AVE
Perceived restorative environment	Being away	0.717	0.718	0.831	0.553
	Fascination	0.726			
	Compatibility	0.818			
	Legibility	0.708			
Place attachment	Place dependence	0.793	0.871	0.761	0.615
	Place identity	0.775			

Table 5
Heterotrait-Monotrait ratio (HTMT) (N = 552).

Variable	Pre				Pa			
	Ba	Fa	Co	Le	Pd	Pi	Pr	Hw
Pre	n.a.							
Ba								
Fa	0.495							
Co	0.518	0.546						
Le	0.518	0.483	0.494					
Pa	n.a.							
Pd	0.263	0.300	0.280	0.255				
Pi	0.229	0.34	0.294	0.241	0.303			
Pr	0.495	0.545	0.547	0.492	0.280	0.323		
Hw	0.599	0.598	0.643	0.651	0.369	0.314	0.629	

Note: Pre=Perceived restorative environment; Ba=Being away; Fa=Fascination; Co=Compatibility; Le=Legibility; Pa=Place attachment; Pd=Place dependence; Pi=Place identity; Pr=Psychological recovery; Hw=Hedonic Well-being.

n.a.: not applicable.

4.2 Structural model assessment

The R^2 values of Place attachment, psychological recovery, and Hedonic Well-being were 0.136, 0.348, and 0.493, respectively. The Q^2 values of all endogenous constructs were greater than zero, and the RMSE values fell within acceptable ranges (Hair et al., 2019; Shmueli et al., 2019; Chin et al., 2020; Lin & Huynh, 2024) (see Table 6).

Table 6
Structural Model Assessment: R^2, Q^2, and RMSE (N = 552).

Endogenous variable	**R^2**	**Q^2**	**RMSE**
Place attachment	0.136	0.132	0.934
Psychological recovery	0.348	0.332	0.822
Hedonic Well-being	0.493	0.455	0.741

4.3 Hypothesis Testing

This study performed 5,000 bootstrapping analyses using SmartPLS 4 (Hair et al., 2019). Hypotheses were supported when $p < 0.05$ and the 95% confidence interval did not include zero (Greenland et al. 2016; Nitzl et al. 2016; Hair et al. 2019; Cheah et al. 2021). All seven hypotheses received empirical support. The direct effect results were as follows: H1: Perceived restorative environmenthas a positive effect on place attachment($\beta = 0.369$, $p < 0.001$); H2: Place attachment has a positive effect on psychological recovery（$\beta = 0.112$, $p < 0.01$）; H3: Psychological recovery has a positive effect on Hedonic Well-being（$\beta = 0.191$, $p < 0.001$）; H4: Perceived Restorative Environment has a positive effect on Hedonic Well-being （$\beta = 0.535$, $p < 0.001$）; H5: Perceived Restorative Environment has a positive effect on psychological recovery （$\beta = 0.540$, $p < 0.001$）; H6: Place attachment has a positive effect on Hedonic Well-being （$\beta = 0.087$, $p < 0.01$）;H7: The serial mediating effect of Perceived Restorative Environment on Hedonic Well-being（$\beta = 0.008$, $p < 0.05$）（see Table 7）.

Table 7
Direct effects and Indirect effects results (N = 552).

Hypothesis	Path	Std β	Std e	t	p	Confidence interva		Support
						2.5%	97.5%	
H1	Pre→Pa	0.369	0.035	10.62	0.000	0.301	0.436	Yes
H2	Pa→Pr	0.112	0.034	3.301	0.001	0.046	0.179	Yes
H3	Pr→Hw	0.191	0.05	3.784	0.000	0.093	0.289	Yes
H4	Pre→Hw	0.535	0.055	9.734	0.000	0.425	0.639	Yes
H5	Pre→Pr	0.540	0.037	14.584	0.000	0.466	0.613	Yes
H6	Pa→Hw	0.087	0.031	2.841	0.005	0.026	0.146	Yes
H7	Pre→Pa→Pr→Hw	0.008	0.003	2.278	0.023	0.002	0.016	Yes

[a]Note: ***p < 0.001, **p < 0.01, *p < 0.05;

[b]Note: Pre=Perceived restorative environment; Ba=Being away; Fa=Fascination; Co=Compatibility; Le=Legibility; Pa=Place attachment; Pd=Place dependence; Pi=Place identity; Pr=Psychological recovery; Hw=Hedonic Well-being.

5. Discussion and Conclusions

5.1 Discussion

This study established a theoretical framework by examining the serial mediation roles of place attachment and psychological recovery, and the multiple direct pathways from perceived restorative environment to hedonic well-being in the Mazu Festival context. All seven hypotheses received empirical support, confirming the proposed sequential pathway from environmental perception through emotional bonding and psychological restoration to well-being outcomes. Based on these findings, this paper proposes the "Dual-Pathway Model of Festival Restorative Experience," which extends restorative environment theory from natural landscapes to culturally saturated festival settings and reveals how temporal constraints and cognitive aging shape restoration pathways.

Several findings warrant further discussion. First, the direct effect of perceived restorative environment on hedonic well-being (H4: β = 0.535) was the strongest among all direct paths, indicating that elderly tourists derive immediate emotional rewards from the festival environment. This finding is consistent with previous findings in a temple context (Lee et al. 2025) and regarding destination restorative perception and quality of life (Si et al. 2024). The result confirms that both ART and SRT mechanisms can be effectively activated in cultural settings, challenging the predominant focus on natural environments in restorative research (Tyrväinen et al. 2014).

Second, the serial mediation pathway (H7: β = 0.008) was significant but relatively small in magnitude. This finding aligns with the restorative stages framework, which posits that psychological recovery consists of two progressive levels—attentional relaxation and deeper reflective restoration (Staats et al. 2003). The modest indirect effect suggests that short-term festival participation may primarily trigger the earlier stage of attentional recovery, while deeper reflective restoration is constrained by limited stay duration and the transient nature of festival events. This temporal boundary condition offers a novel explanation for why prior studies have reported inconsistent findings regarding restoration in short-duration tourism contexts.

Third, the path coefficient for H2 (PA → PR: β = 0.112) was lower than that observed in stable rural environments (Tang et al. 2024). This finding suggests that the formation of place attachment in temporary festival settings, while significant, may not achieve the same depth as in long-term residential or repeated-visit contexts. The loading of place dependence (0.793) was slightly higher than that of place identity (0.775), indicating that elderly tourists prioritize the functional qualities of a place—such as accessibility of ritual participation and perceived physical and psychological safety—over symbolic or identity-based connections in festival contexts (Li et al. 2026). This finding extends the understanding of place attachment formation among aging populations, highlighting the proactive and functional orientation of healthy older adults in temporary cultural settings.

Fourth, the robust performance of Legibility (loading = 0.708) in the four-dimension structure of perceived restorative environment confirms the theoretical proposition that Legibility should be considered independently from Extent in complex environments (Hartig et al. 1997). In high-density, temporary festival spaces, environmental comprehensibility—rather than sheer spatial scale—emerges as a critical determinant of restorative perception. This finding responds to the dimensional debate in restorative environment research and supports the contextual adaptation of measurement frameworks in culturally intensive settings (Dai and Tang 2023a).

5.2 Theoretical Contributions

This study makes several theoretical contributions to restorative environment theory, the S-O-R framework, and place attachment research.

First, this study extends the applicability of restorative environment theory from natural landscapes to cultural festival contexts. Prior research has predominantly focused on natural settings such as forests, green spaces, and urban parks (Tyrväinen et al. 2014), with insufficient attention to culturally intensive settings. This study found that the direct effect of perceived restorative environment on psychological recovery (H5: β = 0.540) was the strongest among all paths involving psychological recovery, confirming that ART and SRT mechanisms can be effectively activated in cultural settings. The robust performance of Legibility (loading = 0.708) further confirms the unique explanatory power of this dimension in temporary, high-mobility festival environments, supporting the theoretical proposition that Legibility should be considered independently in complex environments (Hartig et al. 1997).

Second, this study advances the S-O-R framework by decomposing the organism into temporally ordered stages. Whereas previous studies have predominantly operationalized the organism as parallel emotional states (e.g., pleasure and arousal) (Yang et al. 2025b), the present study conceptualizes place attachment as a primary organismic state and psychological recovery as a secondary organismic state, reflecting the progressive nature of psychological restoration (Staats et al. 2003). This "sequential organism" approach offers a more temporally and cognitively nuanced account of how elderly tourists process festival stimuli, addressing a critical gap in the S-O-R literature concerning the dynamic nature of organismic states.

Third, this study clarifies the dual-pathway mechanism through which perceived restorative environment influences hedonic well-being. The direct emotional gain pathway (H4: $\beta = 0.535$) provides immediate emotional rewards, while the sequential cognitive-affective pathway via place attachment and psychological recovery (H7: $\beta = 0.008$) accumulates deep psychological resources. These two pathways operate synergistically on different time scales, jointly driving well-being generation. This dual-pathway logic extends prior research that has primarily examined bivariate relationships among these constructs (Yoon et al. 2023; Hao et al. 2026; Kim et al. 2026), offering a more comprehensive account of the full sequential mechanism.

Fourth, this study deepens the understanding of place attachment formation among elderly tourists in temporary cultural settings. The path coefficient for H1 (PRE → PA: $\beta = 0.369$) was lower than that found in general samples (Wu et al. 2023), and the loading of place dependence (0.793) was slightly higher than that of place identity (0.775), indicating that elderly tourists prioritize the functional qualities of a place—such as accessibility of ritual participation and perceived safety—over symbolic or identity-based connections in festival contexts (Li et al. 2026). This finding highlights the proactive adaptation strategies of healthy older adults in tourism settings (Lewicka 2011; Buffel et al. 2012), challenging the assumption that place attachment in cultural tourism is primarily identity-driven.

In summary, the Dual-Pathway Model of Festival Restorative Experience proposed in this study posits that immediate emotional gain and sequential cognitive-affective transmission are parallel and complementary pathways, with their relative weights constrained by the temporal attributes of festival activities and the cognitive characteristics of elderly tourists. This model integrates temporality, cognitive aging, and cultural context into a unified explanatory framework of restorative experience

5.3 Practical Implications

The dual-pathway mechanism revealed in this study provides actionable guidance for the age-friendly operation of folk festivals and public wellness governance.

First, festival spatial provision for elderly visitors should be optimized to strengthen functional place dependence. This study found that elderly tourists prioritize functional availability and accessibility in festival settings, and that spatial Legibility and a low-interference environment are important prerequisites for triggering immediate emotional gain. Unlike younger tourists who pursue experiential richness, elderly tourists' psychological recovery highly depends on low cognitive load and high perceived

safety in the environment. Festival management should prioritize simplifying spatial cognitive difficulty, optimizing wayfinding and circulation systems to reduce the risk of spatial disorientation and mental depletion, and providing quiet rest spaces adjacent to core ritual areas as buffer zones. Refined functional environmental provision can strengthen the foundation of place dependence and effectively activate the direct emotional gain pathway of perceived restorative environment.

Second, leveraging the temporal constraints of festivals, long-term immersive experience products should be developed. This study found that a single short-term visit can only achieve superficial attentional recovery, making it difficult to accomplish deep psychological restoration through place attachment. Existing festival operations mostly focus on one-time visitor consumption, neglecting the time-accumulation nature of psychological recovery. Destinations need to shift from a day-trip model to long-term experiential products such as repeated visits and short-term stays, extending visitors' on-site immersive duration to provide the temporal conditions for the sequential transmission of "place attachment → psychological recovery." Through personalized services and family interaction settings, people-place emotional bonds can be deepened, gradually cultivating place identity and releasing the long-term psychological well-being value of the cognitive-affective pathway.

Third, the public psychological wellness value of folk festivals should be explored and integrated into the active aging social service system. Unlike the entertainment attributes of mass tourism, folk festivals, relying on cultural heritage and collective participation, possess the dual values of spiritual solace and social connection, meeting the psychological needs of elderly populations. The Dual-Pathway Model proposed in this study demonstrates that festival participation can achieve immediate emotional repair through environmental optimization, and can also accumulate deep psychological resources through long-term people-place interaction. At the public governance level, folk festivals can be positioned as a low-cost, highly adaptable intervention vehicle for elderly mental health. Through community group organization and public welfare participation support, elderly individuals can be guided to regularly participate in festival activities, using cultural resonance and collective social interaction to alleviate loneliness and enrich social support networks, thus transforming folk cultural tourism resources into public service tools for healthy aging.

5.4 Limitations and Future Directions

This study has several limitations that point to directions for future research.

First, the cross-sectional design cannot capture the dynamic evolution of the Dual-Pathway Model. Future research should adopt a multi-timepoint longitudinal tracking design covering pre-festival, during-festival, and post-festival phases to clarify the temporal dynamics of the sequential mediation pathway.

Second, the single case site limits the external validity of the findings. Meizhou Island represents a unique religious and cultural context, and the generalizability of the findings to other types of festivals—such as secular cultural festivals, commercial events, or religious festivals of different faith traditions—requires further investigation. Future research should test the robustness of the Dual-Pathway Model across diverse festival types.

Third, self-report data are susceptible to recall bias and social desirability effects. The sample primarily comprised active older adults with good functional health, potentially limiting the applicability of the findings to subpopulations with mobility limitations or cognitive impairments. Future research could incorporate physiological indicators (e.g., cortisol levels, heart rate variability) and behavioral observations to complement self-report measures, and attend to the restorative experiences of subgroups with functional limitations.

Fourth, the relatively low R^2 value for place attachment (0.136) suggests that perceived restorative environment explains only a modest portion of the variance in place attachment. Future research should explore additional antecedents of place attachment in temporary festival settings, such as social interaction quality, prior visitation history, and cultural familiarity.

Despite these limitations, this study provides robust empirical evidence for the Dual-Pathway Model of Festival Restorative Experience and offers a theoretical foundation for future research on elderly well-being in culturally intensive tourism contexts.

Declarations

Informed consent

Verbal informed consent was obtained from all participants prior to data collection. Participation was voluntary and anonymous, and respondents could withdraw at any time without consequence.

Author Contribution

M.W.: Conceptualization, Methodology, Investigation, Writing – original draft. W.C.: Supervision, Writing – review & editing. L.C.: Data curation. L.W.: Formal analysis, Validation. All authors reviewed and approved the final manuscript.

Acknowledgements

Not applicable (anonymised for peer review).

Competing interests

The authors declare no competing interests.

Ethical approval

This study was approved by the Ethics Review Committee of the authors' institution (Approval No. [anonymised]) and was conducted in accordance with the Declaration of Helsinki.

Data Availability

The datasets generated and/or analyzed during the current study are available as supplementary materials accompanying this submission and from the corresponding author upon reasonable request. The data have additionally been deposited in the Open Science Framework (OSF) repository for preservation purposes.

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Figures

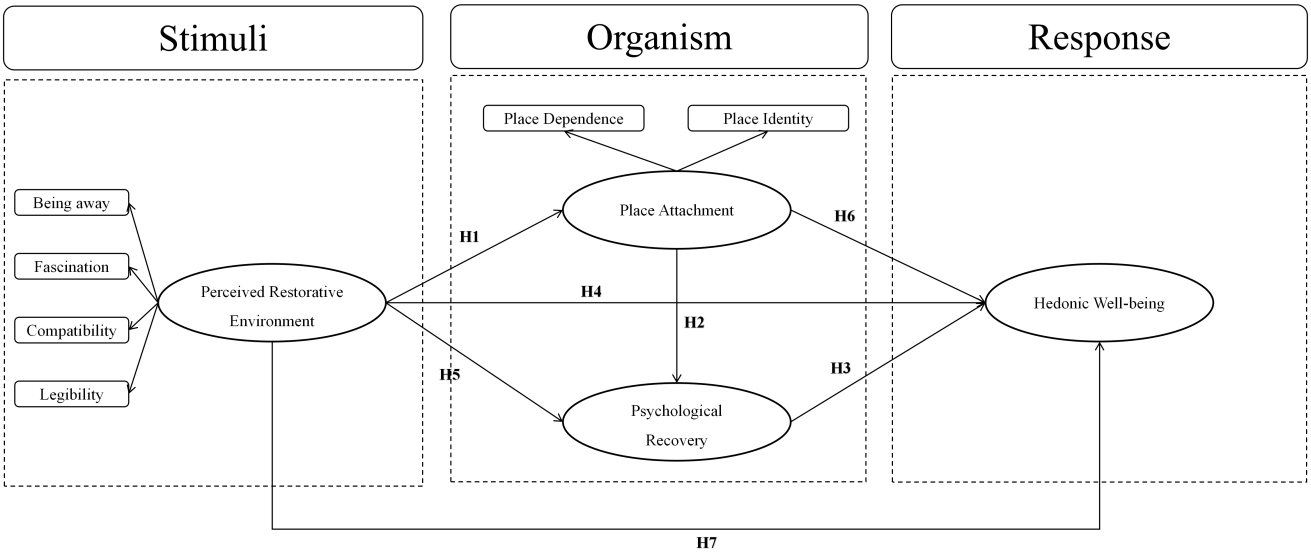


Figure 1

Theoretical framework

Supplementary Files

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- 3.SurveyQuestionnaireEnglishversion.docx
- 4.SurveyQuestionnaireChineseversion.docx
- 7.VariableCodingScheme.docx

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