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THE IMPACT OF VIRTUAL NATURAL ENVIRONMENTS' EXPERIENCE ON PSYCHOLOGICAL RESTORATION

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Abstract

As urbanization accelerates, urban residents increasingly face psychological stress due to reduced access to natural environments. Virtual natural environments (VNEs) have emerged as a promising alternative to traditional natural experiences, yet research on their restorative effects remains limited. The present study aims to evaluate the impacts of experiences in VNEs on psychological restoration, specifically focusing on how experiences of VNEs, such as self-location, possible actions, and sense of reality, influence perceived restoration. This study addresses this gap by investigating the impacts of people's experiences in VNEs on psychological recovery. 453 valid survey questionnaires were collected for this study, which used a quantitative approach and was conducted in China. The relationships between the variables were evaluated in this study using structural equation modelling (SEM). The results demonstrated that the proposed factors of VNEs' experiences significantly contribute to the perceived restoration, confirming the importance of self-location, possible actions, and a sense of reality in enhancing psychological restoration. This study offers empirical support for the influence of VNEs and offers new perspectives on their potential for psychological recovery. It also highlights practical implications for designing and implementing VNEs in urban planning.

Keywords: Attention restoration, Psychological restoration, Stress reduction, Virtual natural environments, Virtual reality.

1. Introduction

Urbanisation and technological advancements have led to increased interest in how natural environments, both real and virtual, can affect psychological well-being. A report from the United Nations (2018) showed that the global population in urban areas will increase by nearly 68% by 2050. Furthermore, in cities, an increasing number of urban residents are experiencing mental health issues due to work and family pressures. For example, stress is becoming a significant cause of mental disease in cities because of intense social competition. According to studies, those who live in cities are more prone to stress and experience more severe reactions to it, including cognitive impairments like anxiety and depression. Compared to small towns, urban residents in big cities face more complex challenges and stress [1].

People can immerse themselves in nature by using virtual experiences to experience the surroundings. For instance, head-mounted displays (HMDs) are motion sensor-equipped devices that provide 360° views of virtual worlds while removing visual contact with the outside world [2]. Hence, as cities continue to expand and the availability of natural spaces becomes increasingly limited, researchers are also actively looking for alternative ways to alleviate the lack of supply of nature. Meeting people's need to connect with natural environments through technology has become critically important.

In China, virtual reality (VR) technology has facilitated the integration of natural environments, offering an opportunity for the contemporary urban population's lack of access to nature. Therefore, in the context of China City, the study of virtual environments for people's experience is crucial for alleviating psychological problems.

It has long been demonstrated in past research that people can alleviate mental health issues through exposure to the natural environment [3-6]. Few studies have examined the restorative benefits of people's experiences on psychological repair in VNEs despite some evidence of the positive impacts of natural environments on mental health. VNEs allow control over specific environmental features, such as weather, surroundings, etc., resulting in a different environmental experience [7].

According to existing research, there are 15 different ways to present natural environments that can provide restorative experiences. These include in real on-site 16 experiences, photography slideshows, video recordings, and virtual reality presentations of 18 real environments [7]. VNEs have emerged as a potential alternative to promote psychological restoration and well-being [7-10]. It relieves the stress of city residents who lack green spaces and enhances their mental health by immersing them in a virtual reality natural environment [9, 11]. These digital environments, often created using VR or other immersive technologies, offer individuals the opportunity to experience the benefits of nature from the comfort of their homes or other indoor settings.

Experiences in VNEs are critical to people's psychological recovery. Although some studies have examined the mechanisms of psychological recovery in virtual natural environments, there has been insufficient research on people's experiences in such environments. Evaluating the role of people's experiences in VNEs on psychological recovery is a key part of improving the quality of VNEs. At the same time, it provides more favourable conditions for people's psychological restoration.

However, as far as we know, few studies have tried to integrate psychological restoration with VNE experience.

Hence, this research aims to examine the impacts of VNEs' experience on psychological restoration, specifically focusing on how different characteristics of VNE experiences influence people's psychological restoration.

2. Literature Review

2.1. The use of virtual reality (VR) in natural environments and the importance of VNEs

Virtual reality is defined as 'the use of artificial sensory stimuli to induce target behaviours in an organism that has little or no awareness of the interference' [12]. A variety of natural environment presentation techniques, such as photography slideshows and video recordings, have been shown in previous studies to provide restorative experiences [13-15]. Previous studies have referred to the sense of presence in virtual worlds as the 'perceptual illusion of non-mediation'. This sense can be a good proxy for a sense of presence. Therefore, presence determines one's experience in a virtual environment [16]. At the same time, presence is also thought to be a prerequisite for eliciting some psychological responses [17, 18].

A previous study examined the impact of both real-world and virtual natural settings on mood (including positive and negative emotion) levels [13]. Because of its high level of immersion, VR may provide a more powerful natural simulation of beneficial effects than television video. Immersion reflects the degree to which a person feels surrounded by, integrated into, and interacting with their environment.

Some studies show that people can be treated by watching 360-degree videos [19, 20]. Several studies evaluating different levels of immersion have reported that more immersive VR setups have a higher sense of presence than less immersive ones [18, 21]. This result also explains the view that the sense of presence is related to people's experienced emotions. In other words, in an environment with a high presence, the experience will show more positive emotions [16].

Virtual environments provide a very convenient way for the urban population to integrate the natural environment with people's reality to a certain extent. Additionally, it gives people who are unable to visit the natural environment an opportunity for psychological restoration regularly. For example, it has been reported that half of the urban population in countries such as Norway and the United Kingdom do not have any contact with the green environment for a week, a rate as high as 80% [8]. In the same way, many urban Chinese do not have enough time or opportunity to go outdoors and enjoy nature.

In summary, presence in VNEs is critical to individuals' psychological recovery, and VR technology can link the benefits of the natural environments; this is a crucial way to promote the psychological restoration of urban residents.

2.2. VNEs' experience and psychological restoration

VNEs have been shown to promote psychological recovery, reduce stress and fatigue, and foster positive emotions and cognitive functioning. These processes of psychological restoration are often explained through Attention Restoration Theory (ART) and Stress Recovery Theory (SRT) [5, 6, 19-21]. These theories suggest that

natural environments can help individuals restore attention and reduce stress, and these effects have been validated in VNEs [7-9]. For instance, a study by Hartmann et al. [17] found that participants reported significant decreases in psychological stress and increased feelings of recovery after exposure to a virtual forest landscape, with effects similar to actual natural environments [11]. These theories emphasise and explain how the visual perception of virtual natural landscapes attracts attention and achieves restoration [22].

A theoretical viewpoint on the viability of this study is offered by the environmental psychology theories of ART and SRT, which suggest that spending time in natural settings will help us lessen the stress brought on by fierce competition [23, 24]. According to certain research, exposure to natural settings has significantly reduced psychological stress and emotions in participants, supporting both SRT and ART [25].

In VNEs, people often gain experiences in the environment through immersion. Immersion represents the degree to which a wide range of more vivid illusions can be provided to the human senses [10]. On the other hand, immersion can often be assessed through the sense of presence. Therefore, the experience of presence is a crucial component of studies examining the efficacy of virtual reality technology. The literature states that self-location, potential actions, and a sense of reality comprise the experience of being present in a virtual environment.

Research has demonstrated the potential of VNEs' experience in enhancing psychological restoration. However, research on the effects of VNEs' experience on psychological healing is quite restricted.

2.2.1. Self-location

Self-location represents the feeling that someone is in an environment that can feel as if they are in a real scene and immersed in it. It makes the user feel like they are "being there" in the virtual world, actively engaging with it instead of only watching it. Presence can improve immersion in the virtual environment by strengthening the bond between the experience and VNEs [17].

In this study, self-location is essential to comprehending how people view and engage with the virtual natural world. The restorative "being away" aspect outlined in Attention Restoration Theory (ART) is simulated by a strong feeling of self-location, which improves the user's capacity to disengage from the stressors of their actual environment. For example, allowing users to fully immerse themselves in a forest or near a lake within the virtual world can aid in relaxation and mental healing.

It is assumed that self-location will directly contribute to psychological recovery. Virtual environment users who feel more present are more likely to feel removed from daily stressors, which promotes stress reduction and cognitive recovery.

2.2.2. Possible actions

Users' apparent degree of control and involvement in the virtual environment is referred to as "possible actions." This dimension includes the capacity to investigate, work with, or interact with virtual space aspects, such as picking flowers, watching animals, or strolling through a virtual forest. Virtual worlds are

distinguished by their interactive components, essential to producing an immersive and captivating experience [17, 26]. According to ART, the "fascination" aspect of restorative surroundings is enhanced by potential activities in the context of this study. Active user interaction with the environment increases engagement, attracts attention, and fosters a sense of agency. For instance, walking through a virtual park or interacting with virtual things can enhance the experience.

2.2.3. Sense of reality

In this research context, "sense of reality" refers to how closely the virtual environment resembles a real-world setting. Realistic noises, complex visuals, and organic movement dynamics are all part of the VNE's sensory, auditory, and visual realism. A key component of VNEs' experience is a sense of reality, which establishes how closely the virtual experience mimics a real-world setting [26].

The Stress Recovery Theory (SRT) tenets, which contend that restorative benefits are linked to calming and aesthetically pleasant stimuli, are consistent with a greater sense of reality. According to this study, a realistic virtual environment-one that replicates the sounds and images of an actual forest, for example-can elicit a more potent restorative reaction than an abstract or less realistic setting. By making the virtual experience more realistic and immersive, a strong sense of reality is expected to improve significantly psychological rehabilitation. Stress reduction and positive affect may be promoted by realistic situations that elicit emotional reactions akin to those found in actual natural settings.

To summarise, the dimensions of self-location, possible actions, and sense of reality shape the overall experience of VNEs. A well-designed VNE with strong self-location, possible interactive actions, and high realism will likely provide a more immersive and engaging experience, leading to greater psychological restoration.

2.3. Summary of literature review

In conclusion, most of the literature references are within the last five years, with a few references before 2010. At the same time, the discussion of the above literature review shows that there are currently insufficient empirical results regarding the impact of VNEs' experiences, including self-location, possible actions, and sense of reality, on people's psychological recovery. This study aims to investigate the effects of individuals' VNE experiences on urban residents' psychological recovery, offering insights into optimising VNE design for enhanced restorative outcomes.

3. Methods

3.1. Research design

The effects of VNEs' experience on psychological recovery are investigated in this study using a quantitative research approach. This study specifically focuses on how different characteristics of VNEs experiences, including self-location, possible actions, and sense of reality, influence perceived restoration among Chinese urban residents.

The questionnaire survey method was employed to collect data from participants through an online platform: questionnaire Star, a common and well-known platform for collecting questionnaire data in China by researchers. The

research design aligns with the objectives of understanding the perception of VNEs and their impact on psychological recovery.

The research follows a deductive approach, grounded in established theories such as the ART and SRT. These theories provide a theoretical foundation for the study by suggesting that natural environments, whether real or virtual, can promote psychological restoration by reducing stress and fatigue, improving mood, and enhancing cognitive function. The deductive approach allows the study to test the predefined hypotheses based on these theories and prior empirical findings in the context of virtual environments.

The study is divided into two main phases: (1) The development and validation of the measurement scales. (2) The assessment of the relationships between variables through structural equation modelling (SEM) using AMOS software. The measurement scales were adapted from existing validated instruments to measure the dimensions of VNEs experiences, including self-location, possible actions, and sense of reality; the psychological restoration of people was used the Perceived Restoration Scale (PRS) to measure. The survey instrument was pre-tested with a small group of respondents to ensure the measurement items' clarity, reliability, and validity.

3.2. Questionnaire survey

The Spatial Presence Experience Scale (SPES) was developed by Hartmann et al. [17] was used to measure people's perceptions. This scale, which has two perceived dimensions-self-location and potential actions-measures people's sensation of presence. To more comprehensively measure people's perception of virtual natural environments, some previous studies were referenced to change the three items in the questionnaire to include another dimension, which is the "sense of reality" [10, 26]. Hence, 11 items were used to measure people's perceptions. Table 1 shows the measure items of experiences in VNEs.

Furthermore, the questionnaire used the PRS to measure people's psychological restoration, adapted from the full version of the PRS [20]. This scale is widely used in environmental psychology and has been tested for reliability and validity by several studies [27, 28]. The psychological restoration measurement consists of four aspects: being away, fascination, coherence, and compatibility from PRS. This scale consists of 5 items.

Item 1 is: That place is fascinating. Item 2 is: I can enjoy myself in this setting and do anything I like. Item 3 is: This is a place away from daily routine and stress. Item 4 is: There are a few hard boundaries here that limit me. Item 5 is: Everything here has a proper place. People's psychological recovery can be comprehensively measured through these 5 measurement items. The questionnaires are all in the form of a 5-point Likert scale. The last section of the questionnaire contains the respondents' general information. The general information includes people's gender, age, and education level.

First, tests for validity and reliability are required. The model's convergent validity and internal consistency were examined using average variance extraction (AVE) and composite reliability (CR). Table 2 displays the analysis results. The result shows that the item of the scale has good internal consistency and convergent validity, this indicates that the questionnaire can be effective in measuring people's perception of VNEs and restoration.

Table 1. Measure items of VNEs' experience.

Constructs	Items	Total items
Self-location	1. I had the impression that I was truly in the natural setting. 2. I had the impression that I was truly involved in the natural environment's activities. 3. My actual location seemed to have moved into the virtual reality environment. 4. I had the impression that I was actually in the virtual reality setting. 5. The objects in the virtual environment gave me the feeling that I could do things with them.	5 items
Possible actions	1. I had the impression that I could be active in the environment of the presentation. 2. I felt like I could move around among the objects in the presentation. 3. It seemed to me that I could do whatever I wanted in the environment of the presentation	3 items
Sense of reality	1. In the virtual generated world l had the sense of 'being there' 2. I thought of the virtual environment as equal to the real environment 3. The virtual world became more real or present to me compared to the real world.	3 items

Source: Spatial Presence Experience Scale (SPES) by Hartmann et al. [17]

Table 2. Reliability and validity of the model.

	CR	AVE
Self-location	0.848	0.6396
Possible action	0.826	0.6143
Sense of reality	0.8345	0.7272
Being away	0.7977	0.6634
Fascinating	0.8532	0.7439
Coherence	0.744	0.921
Compatibility	0.7413	0.9348

3.3. Data collection

The data collection process involved recruiting participants who were Chinese urban residents with varying levels of experience with virtual environments. The inclusion criteria ensured that participants had some basic familiarity with digital devices and virtual reality VR technology to provide meaningful responses. The questionnaire was distributed online and offline to reach a broad demographic and ensure data diversity.

In this study, 453 valid questionnaires were collected through snowball sampling from Shijiazhuang City of China. This city is a provincial city of Hebei province, with 11,233,500 residents and a total area of 14,530 square kilometres;

Shijiazhuang city has a 72.28% urbanisation rate [29], with its high population density, rapid urbanisation, and developing urban public green space.

3.4. Data analysis method

In the data analysis stage, Amos was used to analyse collected data, a program that makes structural equation modelling (SEM) easier. SEM is especially well-suited for this research since it enables the simultaneous analysis of intricate interactions between numerous independent and dependent variables [30]. It also helps test the measurement model for validity and reliability and evaluate the structural model to assess the hypothesised relationships between VNE characteristics and psychological restoration outcomes. The relationships between variables are assessed through SEM.

This study first confirmed the validity and reliability of the model and measurement items using Confirmatory Factor Analysis (CFA). Then, the model fit was tested to ensure the model was prepared for the next step, SEM analysis. Additionally, the regression weights and the connections between the variables were examined using SEM analysis.

4. Result

4.1. Confirmatory factor analysis (CFA) result

The CFA was conducted to evaluate the measurement model's validity and reliability in assessing the latent constructs involved in the study of virtual natural environments and psychological restoration. The CFA results provide evidence for the adequacy of the measurement model based on several key indicators, including factor loadings, model fit indices, and construct validity measures.

Table 3 shows the model fit result. All factor loadings for the observed variables on their respective latent constructs were significant and exceeded the recommended threshold of 0.5, indicating strong relationships between the observed indicators and their underlying factors. For example, the factor loadings for constructs like "Sense of Reality," "Self-location," and "Possible Actions" were all above 0.7, demonstrating robust convergent validity. The model fit index shows a satisfactory fit between the proposed model and the observed data. The key model fit indices are as follows:

i. The degree of discrepancy between the model and the observed data is evaluated using the chi-square statistic; generally, a value of less than 5 denotes a satisfactory fit [31]. This study's chi-square (χ^2)/df value is 2.73; a ratio below 3 indicates a satisfactory model fit.
ii. A measure of the model's ability to explain the variance-covariance of the observed data is the goodness-of-fit index or GFI. A value nearer 1 indicates a great model fit [32]. The value ranges from 0 to 1. According to this study, the GFI value indicating a satisfactory fit between the model and the data is 0.849.
iii. The Comparative Fit Index (CFI) with values nearing 1 indicates a good relative fit [32].The CFI in this study is 0.959, and it is above 0.95, which indicates a very good fit.
iv. The model's error is evaluated using the Root Mean Square Error of Approximation (RMSEA) [32]. In this study, the RMSEA value is 0.062, below the critical value of 0.08, indicating a reasonable fit.

Table 3. Model fit indices of this study.

	Chi-square (χ^2)/df	GFI	AGFI	CFI	RMSEA
Model analysis value	2.735	0.849	0.881	0.959	0.072
Critical value	<0.3	>0.8	>0.8	>0.8	<0.08

4.2. SEM analysis result

The regression weights show the relationships between different constructs and their corresponding indicators. For instance, "PRS" significantly predicts the constructs "Being away," "Fascination," "Coherence," and "Compatibility" with high estimates (e.g., .924 for "Away," .964 for "Fascination"). The Critical Ratio (C.R.) values for these relationships are high, and the p-values are statistically significant ($p<0.05$), indicating strong and positive relationships between the constructs [30]. The result implies that Chinese residents perceived these factors to influence psychological restoration.

The covariances section shows the correlations between the latent constructs (e.g., "self-location," "sense of reality," "possible action," "PRS"). All correlations are significant, suggesting that different aspects of VNEs, including the sense of reality, self-location, and possible actions, are interrelated and contribute to the overall perceived psychological restoration.

Several paths in the SEM model are highly significant with high regression weights (e.g., self-location to possible actions, sense of reality to PRS). This indicates that the perception of being in VNEs, and its sense of reality significantly impacts psychological restoration ($p<0.05$). Moreover, the estimates for "self-location" (.994) and "sense of reality" (.960) are quite high, further supporting the significance of these constructs.

The analysis also shows how different constructs (e.g., "Away," "Fascination," "Compatibility," and "Coherence") as dimensions of perceived restoration play positive roles in psychological restoration ($p<0.05$). For instance, "Away" (.924), "Fascination" (.964), "Compatibility" (1.000), and "Coherence" (1.011) all have high and significant regression weights, suggesting they are important contributors to how VNEs are perceived as restorative.

The SEM analysis results provide a comprehensive understanding of how self-location, sense of reality, and possible actions influence Chinese urban residents' psychological restoration. The findings suggest that all these factors significantly contribute to perceived restoration, supporting the hypothesis that virtual natural environments can positively impact psychological well-being through these constructs.

To summarise, the provided results effectively answer questions by demonstrating that the experiences of VNEs significantly influence psychological restoration through multiple interconnected factors.

5. Discussions

5.1. Discussion of the analysis result

According to the research, the CFA results demonstrated that the constructs used in the study have good reliability and validity, ensuring the robustness of the

measurements. SEM results further revealed that different characteristics of VNEs' experiences, including self-location, possible actions, and sense of reality, significantly influence perceived restoration. Specifically, a sense of reality and possible actions within VNEs showed strong positive effects on psychological restoration, indicating that more immersive and interactive VNEs could better facilitate mental recovery for urban residents.

First, regarding the self-location component, the results show that self-location is important for improving psychological recovery in VNEs. Significant results for self-location variables and high factor loadings imply that the virtual environment's sense of physical presence significantly impacts users' psychological restoration. These findings align with the concept of "presence" in virtual environments, which has been identified as a critical determinant of user engagement and psychological effects [18]. Theoretically, the strong relationship between self-location and psychological restoration supports the "being away" component of Attention Restoration Theory. Self-location facilitates cognitive rest and attentional recovery by creating a sense of immersion and detachment from daily stressors. The ability of VNEs to replicate this restorative mechanism demonstrates their potential as effective alternatives to physical natural environments, particularly for urban residents with limited access to green spaces [18, 29].

However, variations in the factor loadings of different self-location items suggest that not all aspects of presence are equally impactful. For instance, items reflecting spatial orientation (e.g., "I felt physically present in the environment") had higher loadings compared to those emphasising user control within the environment. This discrepancy highlights the need for future research to explore how specific elements of self-location, such as spatial consistency and sensory integration, contribute to the overall restorative experience.

In addition, the observed relationship between possible actions and psychological restoration aligns with ART's "fascination" component, which posits that environments capable of effortlessly capturing attention can facilitate mental recovery. Interactive features, such as the ability to explore or manipulate objects within the environment, enhance engagement and provide a sense of agency, promoting relaxation and attentional recovery. However, excessive or overly complex interactions might introduce cognitive load, potentially reducing the restorative effect. These results suggest a need for balance when designing VNEs to maximise their restorative potential. Simplified, intuitive interactions that allow users to explore the environment without unnecessary effort may be more effective in fostering psychological restoration. Future studies could investigate the optimal level of interactivity for different user groups, as preferences and abilities may vary across demographics.

Sense of reality in VNEs enhances users' sensory engagement, making the experience more immersive and convincing. For instance, visually realistic features, such as high-quality textures, natural lighting, and detailed landscapes, can evoke a stronger emotional response and mimic the calming effects of real natural settings. However, some items in terms of sense of reality exhibited slightly lower loadings, suggesting that visual authenticity alone may not fully capture the feeling of reality. Factors such as auditory and haptic feedback could also contribute to the user's overall perception of realism. Future research could explore

the multidimensional nature of reality and its relative importance in different restorative contexts.

5.2. Contribution of the study

The contributions of this study are as follows: first, it expands the field of restorative environments research from traditional natural environments to virtual natural environments, which provides a new perspective for further understanding the impacts of restoration in virtual natural environments. Second, this study enriches cross-cultural research in the field by examining how the characteristics of virtual natural environment experiences affect psychological recovery in the context of the natural environment, although there are still some psychological and physical aspects of the results that we were not able to explore, our study can provide a solid foundation for subsequent research on the relationship between virtual environments and psychological recovery [33]. Finally, from the perspective of practical standpoint, this study provides quantitative evidence on the impacts of virtual natural environment experiences on psychological recovery through SEM analyses, providing empirical support and guiding suggestions for the design and application of virtual natural environments to give more room to enhance the experience in the virtual natural environment. These contributions improve the understanding of the potential of virtual natural environment experiences in promoting psychological restoration and provide a scientific basis for integrating virtual natural environments in the future.

The results shed important light on how VNEs might be developed and used to improve psychological well-being, especially in crowded cities with limited access to real natural settings. This study also underscores the importance of considering the perceived qualities and experiences of VNEs in promoting psychological restoration. Future research can build upon these results by exploring other potential mediating factors and expanding the demographic scope to validate further and refine the findings.

5.3. Limitations of this study

This study also has some limitations. For instance, just one Chinese city was considered while distributing the questionnaire; even though this city is representative of the study, it might have area limitations on the findings. Future research could identify several representative sample cities to investigate and minimise bias in the findings.

Furthermore, this study only employed a self-reported questionnaire. Future research could add tests of physiological indicators to capture more manifestations of people's psychological responses, such as blood pressure and heart rate variability (HRV) [29], even though these have been verified and successfully tested in several studies. Given that one element of an emotional episode is the physiological reaction to a stimulus, this would be particularly beneficial for emotional responses.

6. Conclusions

This research highlights the promising role of experiences in VNEs as a tool for psychological restoration in urban settings. It offers practical implications for

landscape designers, urban planners, and digital environment developers to create more effective and engaging virtual experiences that cater to the psychological needs of urban residents. This study not only reveals the role of VNEs in psychological recovery but also provides new perspectives for addressing mental health problems brought about by urbanisation. In the context of rapid urbanisation, city dwellers face increasing psychological stress due to the scarcity of natural environments. By quantifying the restorative effects of virtual nature experiences, this study confirms the importance of three key dimensions: sense of self-orientation, possible actions and sense of reality. These findings provide a basis for applying VNEs in mental health interventions. For example, by enhancing the environment's interactivity and sense of reality, virtual reality can offer an alternative path to psychological recovery for urban residents.

Overall, this study highlights the promising role of VNEs in supporting mental health, particularly for urban residents with limited access to natural environments. By optimising self-location, possible actions, and a sense of reality in VNE design, developers and practitioners can create more effective restorative experiences, contributing to broader strategies for improving psychological well-being in increasingly urbanised societies.

Abbreviations

AGFI	Adjusted Goodness of Fit Index
ART	Attention Restoration Theory
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
GFI	Goodness-of-fit index
HMD	Head-mounted displays
HRV	Heart Rate Variability
PRS	Perceived Restoration Scale
RMSEA	Root Mean Square Error of Approximation
SME	Structural Equation Modelling
SPES	Spatial Presence Experience Scale
SRT	Stress Recovery Theory
VNEs	Virtual Natural Environments
VR	Virtual Reality

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