Psychology Research and Behavior Management

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

The Effect of Passion for Outdoor Activities on Employee Well-Being Using Nature Connectedness as the Mediating Variable and Environmental Identity as the Moderating Variable

Chunyu Zhang, Xiao Ma, Liping Liu

School of Economics and Management, Guangxi Normal University, Guilin, 541006, People's Republic of China

Correspondence: Xiao Ma; Liping Liu, School of Economics and Management, Guangxi Normal University, No. 1 Yanzhong Road, Yanshan District, Guilin, 541006, People's Republic of China, Email mxsawyer@163.com; 865248131@qq.com

Purpose: Although prior research has found outdoor activities to be an important effect on employee well-being, the mechanisms of their effect are understudied. This study integrated the Broaden-and-Build Theory, Attention Restoration Theory and Cognitive Assessment Theory to examine the relation between passion for outdoor activities (two dimensions, namely, harmonious passion, obsessive passion) and employee well-being (three dimensions, namely, life well-being, workplace well-being, psychological well-being) by the mediating role of nature connectedness and the moderating role of environmental identity.

Participants and Methods: Data were collected from 403 employees of Guangxi enterprises in China. The structural equation model was constructed using AMOS and SmartPLS to test the hypotheses proposed in this study.

Results: Our results confirm that harmonious passion for outdoor activities had a positive effect on employee nature connectedness, workplace well-being and psychological well-being. Obsessive passion for outdoor activities had a negative effect on employee nature connectedness, life well-being and psychological well-being. Natural connectedness has a positive effect on all three dimensions of employee well-being. Nature connectedness mediates between harmonious passion for outdoor activities and all three dimensions of employee well-being. Environmental identity positively moderated the relationship between nature connectedness and the three dimensions of employee well-being. Harmonious passion for outdoor activities has no direct effect on employee life well-being. Obsessive passion for outdoor activities had no direct effect on employee workplace well-being.

Conclusion: This study reveals the mechanism of passion for outdoor activities on employee well-being from a new perspective and unveils that the two dimensions of passion for outdoor activities have different effects on employees' life well-being, workplace well-being, and psychological well-being. Business managers should give attention to the benefits of outdoor activities and nature connectedness for their employees, through which they can relieve stress at work, recover attention and improve well-being.

Keywords: Passion for Outdoor Activities, Employee Well-being, Broaden-and-Build Theory, Attention Restoration Theory, Cognitive Assessment Theory

Introduction

Well-being, while pivotal to individual fulfillment, is also a cornerstone of societal growth.[1] Its effect extends to not only increasing organizational performance and productivity,[2] but also customer satisfaction,[3] employee engagement,[4] and organizational citizenship behavior.[5] Hence, investigating employee well-being is of substantial significance. As globalization intensifies and as business environments become more dynamic and complex, increased competition among enterprises is causing significant workplace stress among employees.[6] This stress is detrimentally impacting their well-being, job performance, work attitude and organizational commitment.[7–10] Recently, outdoor activities such as Frisbee and camping have risen in popularity, presenting a cathartic outlet for contemporary individuals to alleviate stress and relax.

Received: 26 August 2023
Accepted: 31 October 2023
Published: 4 December 2023

Previously research indicates outdoor activities significantly enhance the well-being of varying age groups including children,[11] the elderly[12] and youth.[13] These benefits are further magnified when the activities involve heightened contact with nature.[14] Furthermore, the positive effect these activities exert on employee well-being has also drawn scholarly attention. Outdoor activities, especially outdoor sports, benefit the well-being of employees.[14,15] However, most of these studies have focused on the general well-being of employees, and few of these studies have divided employee well-being into detailed dimensions. And while many have assessed outdoor activities using objective indicators (frequency[13] and duration[16]), few scholars have investigated the effect of these activities on employee well-being by considering subjective attitudes towards them. So, how does passion for outdoor activities effect employee well-being? For example, how does passion for outdoor activities indirectly affect employee well-being through nature connectedness? This study constructs passion for outdoor activities affects employee well-being through nature connectedness based on the Attention Restoration Theory.[17] In addition, what factors moderate the effect of nature connectedness on employee well-being? For example, how does environmental identity moderate the effect of nature connectedness on the employee well-being? Previous studies have found that environmental Identity positively moderates the relationship between perceived environmental benefits and satisfaction with the government.[18] Based on the Cognitive Assessment Theory,[19] this study endeavors to formulate a moderating mechanism that illustrates the role of environmental identity in bolstering the relationship between nature connectedness and employee well-being.

In this study, employee well-being is categorized into three dimensions: life well-being, workplace well-being, and psychological well-being, and the effect of passion for outdoor activities on employee well-being is explored using nature connectedness as a mediating variable and environmental identity as a moderating variable. And the current study makes three contributions to employee well-being literature. Firstly, our study has comprehensively dissected employee welfare into three distinct dimensions, on each of which we have conducted an extensive exploration. Secondly, our study is based on Broaden-and-Build Theory, Attention Restoration Theory and Cognitive Assessment Theory to illuminate the mediating processes between harmonious passion for outdoor activities and three dimensions of employee well-being. Thirdly, we find that environmental identity moderates the relation between nature connectedness and three dimensions of employee well-being positively.

The structure of paper is as follows. First, we conduct a literature reviewing the fields of passion for outdoor activities, employee well-being, nature connectedness, and environmental identity to set up our research hypotheses. Second, we elucidate our research methodology and describe our process for data collection. Third, the empirical results are presented. Finally, we discuss the theoretical and practical implications.

Literature Review

Passion for Outdoor Activities and Employee Well-Being

Outdoor activities typically constitute any pursuits that are conducted outside, generally within a natural setting.[20] Based on the dualistic model of passion toward an activity,[21] we define "passion for outdoor activities" as a strong inclination toward outdoor activities that people love, find important, and in which they invest time and energy. Furthermore, we distinguish "passion for outdoor activities" into two broad types: harmonious passion for outdoor activities (HPOA) and obsessive passion for outdoor activities (OPOA). Despite being compelling desires to engage in outdoor activities these two categories bear a significant distinction. Harmonious passion is fundamentally regulated by the individual, whereas obsessive passion is not within the individual's control.[22]

Despite the absence of a universally recognized definition or concept of employee well-being (EWB), numerous studies have stemmed from the broader concept of general well-being.[23] A wide array of scholars formulated their distinctive definitions and notions of EWB tailored to their specific research goals and frameworks. Based on Zheng et al's study,[24] we believe that EWB is a holistic concepting employees' evaluation of job satisfaction and life satisfaction as well as the intensity of psychological satisfaction they experience both in their work and personal life. We argue that life well-being (LWB), workplace well-being (WWB), psychological well-being (PWB) are the key components of EWB. Rousseau and Vallerand demonstrated that harmonious passion positively influences subjective well-being aspects such as life satisfaction, meaning in life, and vitality, conversely, obsessive passion augments anxiety and depression.[25] It

is crucial to note that harmonious passions are observed to have a positive correlation with subjective well-being.[26,27] However, obsessive passions have either a negative correlation[27] or no significant relationship,[26] and this research agrees that the former.

In order to examine the relation between passion for outdoor activities (including HPOA and OPOA) and EWB (including LWB, WWB and PWB), this study puts forward the following hypothesis:

H1: HPOA will have a positive effect on EWB—LWB (a), WWB (b), and PWB (c).

H2: OPOA will have a negative effect on EWB—LWB (a), WWB (b), and PWB (c).

Passion for Outdoor Activities and Nature Connectedness

The term "nature connectedness (NC)" denotes an individual's subjective perception of their affiliation with the natural environment.[28] This concept includes how we think about nature, our affective relationship with nature and the extent to which we see ourselves as part of nature.[29] Wolsko and Lindberg suggest that individuals who frequently in outdoor activities may exhibit higher NC.[30] Similarly, Nisbet et al discovered that college students involved in environmental programs managed to sustain their inherent connection to nature.[31]

According to Broaden-and-Build Theory,[32] the emotions experienced in a specific context have significant effects on thought-action repertoires. Firstly, positive emotions facilitate the broadening of thought-action repertoires.[33] Secondly, interest propels immersion and engagement with an entity or activity that stirs such interest, consequently promoting new experiences.[34] Consequently, individuals attracted to the outdoor activities are apt to involve themselves more profoundly therein. The subsequent positive emotions concerning the outdoor activities can motivate exploration and appreciation of the natural environment, thereby augmenting their NC.[35]

In order to examine the relation between passion for outdoor activities (including HPOA and OPOA) and NC, the following hypotheses are put forward:

H3: HPOA will have a positive effect on NC.

H4: OPOA will have a negative effect on NC.

Nature Connectedness and Employee Well-Being

More and more people have become aware of the beneficial effects of nature on the well-being and health of adults and children.[36,37] Previous studies have found that NC has a positive effect on general well-being, with people with stronger NC tending to show higher levels of well-being.[38–41] This study explores the impact of NC on EWB, based on Attention Recovery Theory (ART).[17] The ART posits that sustained engagement in cognitively demanding tasks may precipitate mental fatigue, which can subsequently induce negative emotional states. However, immersion in natural can rejuvenate these negative states[42] even potentially engendering positive emotions and mitigating stress.[43]

Studies in the field of psychology have illustrated nature's potential to enhance general LWB.[44] It has been revealed that interaction with nature correlates with heightened LWB and positive emotions, whilst reducing negative emotional states.[45] Furthermore, the degree of an individual's NC can influence their LWB.[31] The exposure to natural environments been linked with beneficial effects on WWB.[15] Burchett et al discovered that the presence of plants in a workspace significantly enhances employee morale, fostering WWB, and boosting performance.[46] In a given instance of nature exposure, people with higher vs lower levels of NC may be more immersed and involved in nature, resulting in better PWB outcomes.[29] Positive experiences in nature amplify one's connection to the environment, a relationship which correlates with increased PWB.[47] In other words, people with higher NC will report greater levels of PWB.[48]

In order to examine the mediating role of NC, we propose the following hypothesis:

H5: NC will have a positive effect on EWB—LWB, WWB, and PWB.

H6: HPOA will influence EWB—LWB, WWB, and PWB—through NC, which plays a mediating role.

Environmental Identity

Environmental identity (EI), a category of social identity,[49] represents an individual's sense of connection to non-human aspects of the natural environment and the self-interpretation that arises during interactions with nature.[50] There is an acknowledged correlation between NC and personal well-being. The correlation between NC and well-being has been established, and now it is time to analyze how this correlation is formed and how it works. Some pathways have been demonstrated (eg, spirituality, meaning of life), and other possible psychosocial pathways still need to be explored to moderate the relationship between NC and human well-being.[51]

The potential moderating role of EI in the relationship between NC and EWB is a consideration of interest. Employees who recognize their strong connection to it often experience an increased sense of well-being. Nevertheless, the effect of this NC on well-being can differ significantly based on the strength of an employee's EI. For employees with a robust EI, their NC directly enhances LWB, WWB, PWB. Conversely, for those possessing a weaker EI, the correlation between perceived NC and well-being is not as substantial. Essentially, employees with a tenuous EI may not fully appreciate the potential benefits stemming from their NC. As a result, their general well-being might not experience a significant boost.

The Cognitive Assessment Theory[19] provides a foundation for the potential moderating effect under discussion. According to this theory, individuals do not merely acquiesce to the effect of stimuli; they also temper their responses to such stimuli. It is only after this modulation that they can comprehend the nature and significance of these stimulus events.

In order to examine the moderating role of EI, the following hypothesis is proposed:

H7: EI will moderate the relation between NC and EWB—LWB, WWB, and PWB positively. The greater the EI, the stronger NC's effect on EWB—LWB, WWB, and PWB.

Materials and Methods

Sample and Procedure

We cooperated with the questionnaire service provider "Chengdu BeiYanTong Data Technology Co" to create an electronic questionnaire using the "Questionnaire Star" software, and collected data from 403 employees in Guangxi, China through the "Headhunter Network". This research does not study a specific company or occupation. A cover letter explaining the purpose of the study was included on the front page of the questionnaire to ensure that each respondent understood our study and completed the questionnaire voluntarily. We ensured full anonymity for all respondents: Respondents did not need to provide their personal identification information on the questionnaire.

The questionnaire was distributed in August 2023 and a total of 403 valid questionnaires were received. The response rate cannot be reported as we are unable to calculate the specific number of employees who received the electronic survey link. The information of respondents as shown in Table 1.

Measures

Passion for outdoor activities. Passion for outdoor activities was measured in this study using the Passion Scale designed by Vallerand et al[52] analyzes the passion for outdoor activities in terms of two facets - HPOA and OPOA - which are further subdivided into 14 items. To illustrate, statements such as "Outdoor activities allows me to live a variety of experiences" (representing harmonious passion), with a Cronbach's α value of 0.906, and "I cannot live without outdoor activities" (representing obsessive passion), with a Cronbach's α value of 0.909.

NC. The study used Mayer and Frantz's Connectedness to Nature Scale (CNS).[53] Unlike the NEP and Schultz's conception of connection to nature, our measure is affective. Unlike the INS, it is a reliable, multi-item scale. And unlike the IAT, it is easy to administer and predicts behavior quite well.[53] The scale has 14 items. For example, "I often feel a sense of oneness with the natural world around me". The scale's Cronbach α is 0.955.

Table 1 Demographic Data of Respondents

Description		Frequency	Percentage	Description		Frequency	Percentage
Gender	Male	194	48.14%	Occupation	Marketing	25	6.20%
	Female	209	51.86%		Purchasing agent	34	8.44%
Age	Under 24 years old	51	12.66%		Executive staff	16	3.97%
	25–34 years old	141	34.99%		Human resource	27	6.70%
	35–44 years old	114	28.29%		Product/operations	24	5.96%
	45–54 years old	63	15.63%		Tradesman	9	2.23%
	Over 55 years old	34	8.44%		Financial staff/ accountant/cashier/ auditor	15	3.72%
The degree of education	Below junior high School	0	0.00%		Enterprise manager	31	7.69%
	Senior high School/ technical secondary school	32	7.94%		Lawyer/law works	33	8.19%
	College degree	141	34.99%		Designer	40	9.93%
	Bachelor's degree	185	45.91%		Services	17	4.22%
	Graduate education	45	11.17%		Engineering technician	19	4.71%
Monthly salary (RMB)	Less than 3000	12	2.98%		Farmer	28	6.95%
	3001–5000	57	14.14%		Worker	19	4.71%
	5001–8000	194	48.14%		Housewife/ househusband	37	9.18%
	8001–12,000	104	25.81%		Freelancer	4	0.99%
	More than 12,001	36	8.93%		Retiree	0	0.00%
Working hours per week	Less than 30	0	0.00%		Student	0	0.00%
	31–40	176	43.67%		Teacher	11	2.73%
	41–50	185	45.91%		Medical staff	4	0.99%
	51–60	23	5.71%		Researcher	7	1.74%
	More than 61	19	4.71%		Official	3	0.74%

EWB. The study measured EWB using a scale formulated by Zheng et al[24] incorporating three dimensions comprised of 18 distinct items. The first dimension, LWB, includes six items such as, "I feel satisfied with my life". Its Cronbach α is 0.892. The second dimension, WWB, includes six items such as, "In general, I feel fairly satisfied with my present job". Its Cronbach α is 0.907. The third dimension, PWB, includes six items such as, "I handle daily affairs well". Its Cronbach α is 0.9.

EI. EI is measured with eleven items adopted from Stets and Biga.[54] In this research, EI was employed as a moderating variable, rather than a measure of NC. So, we chose the scale that did not conflict with the items in the CNS to measure EI. For example, "I am in cooperation with the natural environment". The scale's Cronbach α is 0.948.

The Cronbach α of the above scales were all greater than or equal to 0.9, proving excellent reliability.

The questionnaire consists of eight parts, the latter seven of which are formal questions. The questions on the scale previous scholars developed are answered on a 5-point Likert scale. The first section collects the respondents' socio-demographic information, including gender, age, education level, occupation, monthly income, and weekly working

hours. In addition, the original scale was written in English and was inconsistent with the respondents' language. After translating it into Chinese, a back-translation method was adopted to check the translation effect.[55]

Results

Model Fitting and Convergence Validity

Confirmatory factor analysis (CFA) was performed in AMOS to test the models' fit, and the results are shown in Table 2. The indicators of the seven-factor model were clearly better than those of the alternative models. Furthermore, we used CMIN/DF < 3.0,[56] GFI > 0.90,[57] AGFI > 0.80,[58] IFI >0.90,[59] CFI > 0.90,[60] RMSEA < 0.05[61] and SRMR < 0.08[57] as model fitness indices. Even though the GFI of the seven-factor model failed to attain the stipulated threshold, other indicators successfully met the criteria.

Convergent validity was tested by composite reliability (CR) and the average variance extracted (AVE). As shown in Table 3, all items' factor loadings exceeded 0.6,[62] and each variable's CR value was higher than 0.8.[62,63] The AVE of all variable scores was greater than 0.5.[63]

Common Method Variance (CMV)

Various methods were used to detect CMV effect. Firstly, Herman's one-factor test was performed and factor analysis was performed in SPSS v. 25 software, which showed that multiple factors were extracted with the maximum degree of factor explanation was 33.305% (<50%).[64] Secondly, as shown in Table 2, the hypothesized model was found to significantly better fit the data than the one factor models. Both results indicate that no serious CMV exists.[65]

Correlation and Discriminant Validity

Correlation analysis was performed with SPSS, as shown in Table 4. There was a negative correlation between OPOA and other variables, and there was a positive correlation between the other variables. The diagonal is the square root of AVE. The square root of AVE is greater than the correlation coefficient of the same column and indicated that the variables have discriminant validity.

Hypothesis Tests

A structural equation model was constructed in SmartPLS to test the hypotheses, as shown in Table 5 and Figure 1. We deployed 5000 bootstraps and a 95% bias-corrected confidence interval to examine the effects.[66]

Table 2 Model Fit

	CMIN/DF	GFI	AGFI	IFI	CFI	RMSEA	SRMR
Seven-factor model	1.077*	0.878	0.867	0.992	0.992	0.014	0.0305
Six-factor model (HPOA+OPOA, NC, LWB, WWB, PWB, EI)	1.819***	0.723	0.7	0.916	0.916	0.045	0.0522
Five-factor model (HPOA, OPOA, NC, LWB+WWB+PWB, EI)	2.18***	0.698	0.673	0.879	0.878	0.054	0.0559
Four-factor model (HPOA+OPOA, NC, LWB+WWB+PWB, EI)	2.914***	0.595	0.563	0.803	0.802	0.069	0.0696
Three-factor model (HPOA+OPOA, NC+LWB+WWB+PWB, EI)	4.447***	0.413	0.368	0.644	0.643	0.093	0.1031
Two-factor model (HPOA+OPOA, NC+LWB+WWB+PWB+EI)	5.177***	0.375	0.329	0.568	0.566	0.102	0.1115
Single-factor model	5.698***	0.364	0.317	0.514	0.512	0.108	0.1155

Notes: N = 403. *p < 0.05; ***p < 0.001.

Abbreviations: CMIN/DF, Chi-Square/Degrees of freedom; GFI, Goodness of Fit Index; AGFI, Adjusted Goodness-of-Fit Index; IFI, Incremental Fit Index; CFI, Comparative Fit Index; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Residual. HPOA, harmonious passion for outdoor activities; OPOA, obsessive passion for outdoor activities; NC, nature connectedness; LWB, life well-being; WWB, workplace well-being, PWB, psychological well-being.

Table 3 Factor Loading and Convergent Validity

Variables	Order	Loading Factor	AVE	CR	Variables	Order	Loading Factor	AVE	CR
HPOA	Q1	0.764	0.581	0.907	LWB	Q29	0.776	0.579	0.892
	Q2	0.756				Q30	0.745		
	Q3	0.753				Q31	0.794		
	Q4	0.787				Q32	0.753		
	Q5	0.766				Q33	0.727		
	Q6	0.768				Q34	0.769		
	Q7	0.74			WWB	Q35	0.787	0.62	0.907
OPOA	Q8	0.76	0.589	0.909		Q36	0.767		
	Q9	0.754				Q37	0.76		
	Q10	0.788				Q38	0.785		
	Q11	0.774				Q39	0.79		
	Q12	0.772				Q40	0.833		
	Q13	0.757			PWB	Q41	0.77	0.602	0.901
	Q14	0.765				Q42	0.787		
NC	Q15	0.75	0.601	0.955		Q43	0.77		
	Q16	0.757				Q44	0.796		
	Q17	0.781				Q45	0.767		
	Q18	0.773				Q46	0.764		
	Q19	0.808			EI	Q47	0.791	0.624	0.948
	Q20	0.751				Q48	0.788		
	Q21	0.785				Q49	0.804		
	Q22	0.783				Q50	0.793		
	Q23	0.785				Q51	0.788		
	Q24	0.79				Q52	0.769		
	Q25	0.746				Q53	0.795		
	Q26	0.772				Q54	0.797		
	Q27	0.807				Q55	0.788		
	Q28	0.757				Q56	0.781		
						Q57	0.796		

Abbreviations: HPOA, harmonious passion for outdoor activities; OPOA, obsessive passion for outdoor activities; NC, nature connectedness; LWB, life well-being; WWB, workplace well-being, PWB, psychological well-being.

The adjusted R2 of the NC was 0.213, which indicated that the model explained 21.3% of NC. Further, the adjusted R2 of LWB, WWB, and PWB were 0.273, 0.343, and 0.316, respectively, which indicates that the model explained 27.3% of LWB, 34.3% of WWB, and 31.6% of PWB.

Table 4 Correlation and Discriminant Validity

	HPOA	OPOA	NC	LWB	WWB	PWB	EI
HPOA	0.762						
OPOA	−0.382**	0.767					
NC	0.382**	−0.389**	0.775				
LWB	0.341**	−0.405**	0.408**	0.761			
WWB	0.44**	−0.387**	0.428**	0.424**	0.787		
PWB	0.405**	−0.439**	0.384**	0.370**	0.427**	0.776	
EI	0.444**	−0.468**	0.431**	0.397**	0.476**	0.451**	0.79

Notes: **At the 0.01 level (two-tailed), the correlation is significant. The diagonal is the square root of AVE.
Abbreviations: HPOA, harmonious passion for outdoor activities; OPOA, obsessive passion for outdoor activities; NC, nature connectedness; LWB, life well-being; WWB, workplace well-being, PWB, psychological well-being.

Table 5 Summary of Hypothesis

Path			95% Confidence Interval				VIF
			PC		BC		
Direct effect	**Beta**	**p-value**	**2.50%**	**97.50%**	**2.50%**	**97.50%**	
HPOA->LWB	0.095	0.073	−0.010	0.196	−0.010	0.196	1.384
HPOA->WWB	0.200	0.000	0.103	0.295	0.102	0.294	1.384
HPOA->PWB	0.162	0.001	0.067	0.260	0.065	0.257	1.384
OPOA->LWB	−0.184	0.001	−0.292	−0.075	−0.288	−0.073	1.441
OPOA->WWB	−0.094	0.088	−0.198	0.017	−0.198	0.016	1.441
OPOA->PWB	−0.204	0.000	−0.303	−0.099	−0.305	−0.101	1.441
NC->LWB	0.212	0.000	0.122	0.308	0.114	0.301	1.357
NC->WWB	0.191	0.000	0.094	0.285	0.093	0.283	1.357
NC->PWB	0.135	0.005	0.040	0.228	0.037	0.225	1.357
HPOA->NC	0.275	0.000	0.185	0.364	0.184	0.363	1.170
OPOA->NC	−0.285	0.000	−0.372	−0.199	−0.369	−0.196	1.170
EI->LWB	0.163	0.002	0.061	0.271	0.060	0.270	1.521
EI->WWB	0.245	0.000	0.142	0.349	0.140	0.347	1.521
EI->PWB	0.212	0.000	0.112	0.307	0.106	0.303	1.521
Moderating effect							
NC*EI->LWB	0.108	0.031	0.007	0.204	0.012	0.206	1.106
NC*EI->WWB	0.114	0.017	0.017	0.202	0.019	0.204	1.106
NC*EI->PWB	0.093	0.039	0.005	0.180	0.006	0.181	1.106

(*Continued*)

Table 5 (Continued).

Path			95% Confidence Interval				VIF
			PC		BC		
Direct effect	**Beta**	**p-value**	**2.50%**	**97.50%**	**2.50%**	**97.50%**	
Indirect effect							
HPOA->NC->LWB	0.085	0.000	0.030	0.094	0.030	0.094	
HPOA->NC->WWB	0.053	0.000	0.025	0.084	0.025	0.084	
HPOA->NC->PWB	0.037	0.011	0.011	0.068	0.012	0.070	
Total effect							
HPOA->LWB	0.153	0.000	0.030	0.094	0.030	0.094	
HPOA->WWB	0.252	0.000	0.025	0.084	0.025	0.084	
HPOA->PWB	0.199	0.011	0.011	0.0.068	0.012	0.070	
OPOA->LWB	−0.245	0.000	−0.098	−0.031	−0.098	−0.031	
OPOA->WWB	−0.148	0.002	−0.093	−0.024	−0.093	−0.025	
OPOA->PWB	−0.242	0.010	−0.070	−0.011	−0.071	−0.012	

Abbreviations: HPOA, harmonious passion for outdoor activities; OPOA, obsessive passion for outdoor activities; NC, nature connectedness; LWB, life well-being; WWB, workplace well-being, PWB, psychological well-being.

H1 expected that HPOA is positively associated with EWB—LWB, WWB, and PWB. HPOA had a positive and significant effect on WWB (β=0.200, $p < 0.001$) and PWB (β=0.162, $p < 0.01$) respectively. HPOA's positive effect on LWB (β=0.095, $p = 0.073$) was not significant. Hence, Hypotheses 1b and 1c was supported, but Hypotheses 1a were not supported.

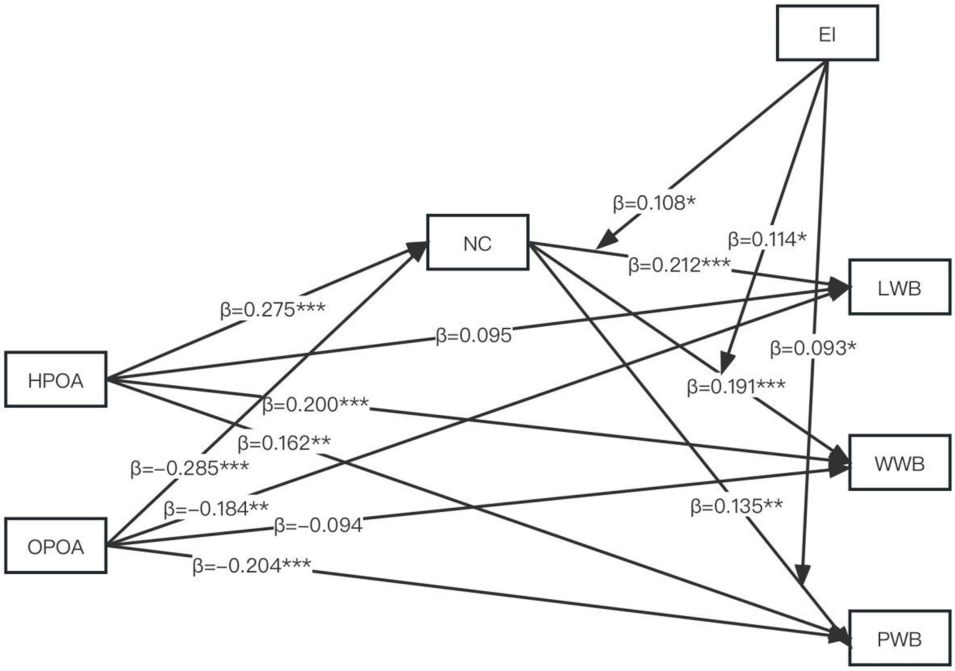

Figure 1 Research framework.
Notes: *p<0.05; **p<0.01; ***p<0.001.

H2 expected that OPOA is negatively associated with EWB—LWB, WWB, and PWB. OPOA had a negative and significant effect on LWB (β=−0.184, $p < 0.01$) and PWB (β=−0.204, $p < 0.001$) respectively. OPOA's negative effect on WWB (β=−0.094, $p = 0.088$) was not significant. Hence, Hypotheses 2a and 2c was supported, but Hypotheses 2b was not supported.

H3 proposed that HPOA is positively associated with NC. HPOA affected NC positively and significantly (β=0.275, $p < 0.001$), and hence, Hypothesis 3 was supported. H4 proposed that OPOA is negatively associated with NC. OPOA affected NC negatively and significantly (β=−0.285, $p < 0.001$), and hence, Hypothesis 4 was supported.

H5 posited that NC is positively associated with EWB—LWB, WWB, and PWB. NC had a positive and significant effect on LWB (β=0.212, $p < 0.001$), WWB (β=0.191, $p < 0.001$), and PWB (β=0.135, $p < 0.01$) respectively. Hence, Hypotheses 5 was supported. H6 posited that NC mediates the relationship between HPOA and EWB—LWB, WWB, and PWB. HPOA affected LWB (β=0.085, $p < 0.001$), WWB (β=0.053, $p < 0.001$), and PWB (β=0.037, $p < 0.05$) through NC positively and significantly, which demonstrated that NC had mediating effects. Therefore, Hypotheses 6 was supported.

H7 expected that EI moderates the relationship between NC and EWB—LWB, WWB, and PWB. EI moderated NC's effect on LWB (β=0.108, $p < 0.05$), WWB (β=0.114, $p < 0.05$) and PWB (β=0.093, $p < 0.05$), respectively, positively. Hence, Hypotheses 7 was supported.

Discussion

Theoretical Implications

This study integrated the Broaden-and-Build Theory, Attention Restoration Theory and Cognitive Assessment Theory to examine the relation between passion for outdoor activities and EWB by the mediating role of NC and the moderating role of EI. Our research findings have the following academic contributions.

Firstly, investigations focusing specifically on EWB within the context of research on outdoor activities on well-being are somewhat limited. The majority of these studies assess employees' general well-being[14] or WWB,[67] with very few authors delving into a more detailed subdivision of EWB. In contrast, this study utilizes insights from prior research on the effect of outdoor activities on EWB by categorizing EWB into three dimensions: LWB, WWB, and PWB,[24] each of which is rigorously examined. This comprehensive approach enables a more inclusive understanding of the relationship between outdoor activities and EWB research. The study adopts a unique approach towards analyzing the relationship between outdoor activities and EWB. Instead of focusing solely on the frequency or duration of the activities as undertaken in previous research,[13,16] we explored the individual's subjective attitude towards outdoor activities. In this study, we have utilized the dichotomy of passion towards activities to measure employee passion for outdoor activities.[21]

Secondly, our research found that HPOA had a positive effect on employees' WWB and PWB. OPOA had a negative effect on employees' NC, LWB and PWB. HPOA had a positive effect on employees' NC, which is consistent with Carter's conclusion.[35] NC has a positive effect on all three dimensions of EWB, which is consistent with Sianoja et al, Nisbet et al, Richardson et al.[15,31,48] But HPOA has no direct effect on employees' LWB, and OPOA had no direct effect on employees' WWB. This is due to the fact that Hypotheses 1 and 2 were hypothesized on the basis of the effects of HPOA and OPOA on subjective well-being. Subjective well-being, however, includes more than just overall satisfaction with life, but also includes high-level positive emotions and low-level negative emotions,[68] so it is not representative of LWB. For WWB, previous research has shown that utilizing WWB measures can provide a more accurate assessment of EWB than do subjective well-being measures alone.[69] PWB is highly correlated with subjective well-being[70] so the hypothesis of the effect of HPOA and NC on PWB is supported in this study. In the passion for activities and well-being research, much of the previous research has explored the effect of passion for outcomes to produce an effect on outcomes, eg, the effect of passion for work on subjective well-being at work,[27] and the effect of passion for physical activity on subjective well-being and athletic performance.[26] While the above illustrates that employees' subjective well-being is related to all three dimensions of EWB, including LWB, WWB, and PWB, which are explored in this study, there are also large distinctions, so generalizations cannot be made. The positive effect of HPOA on LWB is not significant. This could be attributed to the potential restrictiveness of outdoor activities' influence, only a small portion of EWB. Other critical factors, such as job satisfaction and personal relationships, may have a more significant role in

shaping an employees' LWB. The positive effect of OPOA on WWB is not significant. This could be attributed to the fact that the OPOA also leads to employees engaging in outdoor activities to contact with nature, which causes them to stop working for a while, when the stress and negativity associated with work will not be on the rise. While this may not increase the WWB, there is a high probability that it will stop the WWB from decreasing.

Thirdly, our research found that NC mediates between HPOA and all three dimensions of EWB. EI positively moderated the relationship between NC and the three dimensions of EWB. Past research frequently engages EI as a variable in measuring NC. However, a recent meta-analysis suggested that though there is a correlation between NC and EI, distinct differences also exist.[71] This aligns with our idea. The correlation coefficient between NC and EI in our study was 0.503 ($p<0.01$). Yet, the excellent discriminant validity allowed EI to emerge as a moderating variable within our study.

Practical Implications

Our research provides several practical implications for management. First, our research found that HPOA affects EWB through NC. Employees enjoy and are attracted to the outdoor activities and have a variety of experiences and memorable experiences in the outdoor activities, which leads to high levels of HPOA.[52] These allow employees to enhance their NC, which improves their well-being in life, work, and psychology. Businesses may consider implementing a greater number of outdoor activities within their team building and wellness programs, as well as promoting leisurely outdoor activities among their workforce. Employees develop an appreciation for the outdoors through these activities, and increased contact with nature can improve general health.

Second, our research shed light on the beneficial effects of NC on EWB. Employees' affinity for, relationship with, and proximity to other flora and fauna, along with their sense of equality with other life forms and their self-identification as part of the natural environment, demonstrate a high level of NC.[53] This connection enhances their LWB, WWB and PWB. Firms can actualize a balanced lifestyle culture by promoting the pursuit of interests outside of work, which matching the preferences of the contemporary youth, thereby acting as a magnet for top-tier talents.

Third, the study unveils that EI moderates the relation between NC and employees' LWB, WWB, and PWB positively. Employees' environmental identity can be significantly amplified and the benefits of NC for EWB are made more evident by promoting employees' care, protection, respect, love, and reliance on the natural environment, as well as encouraging their active involvement and collaboration with the natural world.[54] Companies that embody green and environment-friendly values, and factor in the level of EI during recruitment, are more likely to align with their workforce's values. This congruence can lead to significant ameliorations in their EWB, in turn fostering a more efficient work environment.[72]

Research Limitations and Recommendations

Our study is subject to certain limitations. Firstly, the discovery of low Beta values for the paths "HPOA->NC->LWB", "HPOA->NC->WWB", and "HPOA->NC->PWB" implies that the investigation might have overlooked several mediators. Future studies should therefore strive to identify other mediating variables that influence the relationship between passion for outdoor activities and EWB. Secondly, we relied on single time-point self-assessment data and used some methodologies to ensure that any common method bias did not excessively influence our results. However, subsequent studies might consider adopting longitudinal data to examine causal better. Thirdly, we investigated the effect of these activities on EWB by considering subjective attitudes towards them. Nevertheless, the factors that instigate passion for outdoor activities remain undefined. Subsequent research could potentially delve into the preceding variables that evoke a passion for outdoor activities.

Ethics Statement

This study was conducted in accordance with the Declaration of Helsinki. This study was approved by the Ethics Committee of Guangxi Normal University. Informed consent was obtained from all participants included in this study.

Funding

This study was supported by the Innovation Program of Guangxi Graduate Education (grant number: XJCY2023010); Guangxi Normal University Natural Science Foundation Project (grant number: 2022PY005); National Social Science Foundation Youth Project (grant number: 23CSH077); Guangxi Philosophy and Social Science Planning Research Project (grant number: 22FSH019); Guangxi Philosophy and Social Science Planning Research Project (grant number: 23FSH022).

Disclosure

The authors report no conflicts of interest in this work.

References

1. Rudolph CW, Murphy LD, Zacher H. A systematic review and critique of research on "healthy leadership". *Leadersh Q*. 2020;31(1):101335. doi:10.1016/j.leaqua.2019.101335
2. Hewett R, Liefooghe A, Visockaite G, Roongrerngsuke S. Bullying at work: cognitive appraisal of negative acts, coping, wellbeing, and performance. *J Occup Health Psychol*. 2018;23(1):71–84. doi:10.1037/ocp0000064
3. Sharma P, Kong TTC, Kingshott RP. Internal service quality as a driver of employee satisfaction, commitment and performance: exploring the focal role of employee well-being. *J Serv Manag*. 2016;27(5):773–797. doi:10.1108/JOSM-10-2015-0294
4. Liu L, Zhang C, Fang -C-C. Effects of health-promoting leadership, employee health on employee engagement: employability as moderating variable. *Int J Workplace Health Manag*. 2021;15(1):1–18. doi:10.1108/IJWHM-07-2020-0122
5. Mousa M, Massoud HK, Ayoubi RM. Gender, diversity management perceptions, workplace happiness and organisational citizenship behaviour. *Employ Relat*. 2020;42(6):1249–1269. doi:10.1108/ER-10-2019-0385
6. Dai T, Dong H, Lei X. Originating from challenge or bullying: a study on the mechanism of how workplace stress acts on destructive voice behavior. *Manage Rev*. 2022;34(7):246–254.
7. Chaudhary A, Cheema AU, Sheikh L, Islam T. How does compulsory citizenship behavior disturb police employees' psychological health? The roles of work–family conflict and putting family first. *Int J Public Sect Manag*. 2023. doi:10.1108/IJPSM-03-2023-0073
8. Liu L, Zhang C. Cyberloafing at the workplace: effect of Zhong-Yong thinking on mental health and mindfulness as a moderating role. *Chin Manage Stud*. 2022;17(3):529–544. doi:10.1108/CMS-09-2021-0381
9. Xiao Q, Liang X, Liu L, Klarin A, Zhang C. How do work–life balance programmes influence nurses' psychological well-being? The role of servant leadership and learning goal orientation. *J Adv Nurs*. 2023;79(7):2720–2731. doi:10.1111/jan.15654
10. Yu J, Park J, Hyun SS. Impacts of the COVID-19 pandemic on employees' work stress, well-being, mental health, organizational citizenship behavior, and employee-customer identification. *J Hosp Mark Manag*. 2021;30(5):529–548. doi:10.1080/19368623.2021.1867283
11. Poulain T, Sobek C, Ludwig J, et al. Associations of green spaces and streets in the living environment with outdoor activity, media use, overweight/obesity and emotional wellbeing in children and adolescents. *Int J Environ Res Public Health*. 2020;17(17):6321. doi:10.3390/ijerph17176321
12. Cabrita M, Lousberg R, Tabak M, Hermens HJ, Vollenbroek-Hutten MM. An exploratory study on the impact of daily activities on the pleasure and physical activity of older adults. *Eur Rev Aging Phys Act*. 2017;14(1):1–11. doi:10.1186/s11556-016-0170-2
13. Jackson SB, Stevenson KT, Larson LR, Peterson MN, Seekamp E. Outdoor activity participation improves adolescents' mental health and well-being during the COVID-19 pandemic. *Int J Environ Res Public Health*. 2021;18(5):2506. doi:10.3390/ijerph18052506
14. Korpela K, De Bloom J, Sianoja M, Pasanen T, Kinnunen U. Nature at home and at work: naturally good? Links between window views, indoor plants, outdoor activities and employee well-being over one year. *Landsc Urban Plan*. 2017;160:38–47. doi:10.1016/j.landurbplan.2016.12.005
15. Sianoja M, Syrek CJ, de Bloom J, Korpela K, Kinnunen U. Enhancing daily well-being at work through lunchtime park walks and relaxation exercises: recovery experiences as mediators. *J Occup Health Psychol*. 2018;23(3):428–442. doi:10.1037/ocp0000083
16. Chen J-Y, Strodl E, Huang L-H, Chen Y-J, Yang G-Y, Chen W-Q. Early electronic screen exposure and autistic-like behaviors among preschoolers: the mediating role of caregiver-child interaction, sleep duration and outdoor activities. *Children*. 2020;7(11):200. doi:10.3390/children7110200
17. Kaplan S, Berman MG. Directed attention as a common resource for executive functioning and self-regulation. *Perspect Psychol Sci*. 2010;5(1):43–57. doi:10.1177/1745691609356784
18. Li DX, Kim S, Lee YK, Griffin M. Sustainable environmental development: the moderating role of environmental identity. *Asia J Soc Psychol*. 2016;19(4):298–310. doi:10.1111/ajsp.12146
19. Lazarus RS. *Emotion and Adaptation*. Oxford University Press; 1991.
20. Andkjær S, Arvidsen J. Places for active outdoor recreation–a scoping review. *J Outdoor Recreat Tour*. 2015;12:25–46. doi:10.1016/j.jort.2015.10.001
21. Vallerand RJ. On passion for life activities: the dualistic model of passion. In: *Advances in Experimental Social Psychology*. Vol. 42. Elsevier; 2010:97–193.
22. Vallerand RJ, Rousseau FL, Grouzet FM, Dumais A, Grenier S, Blanchard CM. Passion in sport: a look at determinants and affective experiences. *J Sport Exerc Psychol*. 2006;28(4):454–478. doi:10.1123/jsep.28.4.454
23. Ilies R, Schwind KM, Heller D. Employee well-being: a multilevel model linking work and nonwork domains. *Eur J Work Organ Psychol*. 2007;16(3):326–341. doi:10.1080/13594320701363712
24. Zheng X, Zhu W, Zhao H, Zhang C. Employee well-being in organizations: theoretical model, scale development, and cross-cultural validation. *J Organ Behav*. 2015;36(5):621–644. doi:10.1002/job.1990
25. Rousseau FL, Vallerand RJ. Le rôle de la passion dans le bien-être subjectif des aînés. *Revue Québécoise de psychol*. 2003;24(3):197–211.

26. Vallerand RJ, Mageau GA, Elliot AJ, Dumais A, Demers M-A, Rousseau F. Passion and performance attainment in sport. *Psychol Sport Exerc*. 2008;9(3):373–392. doi:10.1016/j.psychsport.2007.05.003
27. Vallerand RJ, Salvy SJ, Mageau GA, et al. On the role of passion in performance. *J Pers*. 2007;75(3):505–534. doi:10.1111/j.1467-6494.2007.00447.x
28. Martin L, White MP, Hunt A, Richardson M, Pahl S, Burt J. Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *J Environ Psychol*. 2020;68:101389. doi:10.1016/j.jenvp.2020.101389
29. Liu H, Nong H, Ren H, Liu K. The effect of nature exposure, nature connectedness on mental well-being and ill-being in a general Chinese population. *Landsc Urban Plan*. 2022;222:104397. doi:10.1016/j.landurbplan.2022.104397
30. Wolsko C, Lindberg K. Experiencing connection with nature: the matrix of psychological well-being, mindfulness, and outdoor recreation. *Ecopsychology*. 2013;5(2):80–91. doi:10.1089/eco.2013.0008
31. Nisbet EK, Zelenski JM, Murphy SA. Happiness is in our nature: exploring nature relatedness as a contributor to subjective well-being. *J Happiness Stud*. 2011;12(2):303–322. doi:10.1007/s10902-010-9197-7
32. Fredrickson BL. The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions. *Am Psychol*. 2001;56(3):218–226. doi:10.1037/0003-066X.56.3.218
33. Waugh CE, Fredrickson BL. Nice to know you: positive emotions, self–other overlap, and complex understanding in the formation of a new relationship. *J Posit Psychol*. 2006;1(2):93–106. doi:10.1080/17439760500510569
34. Izard CE. *Human Emotions*. Springer Science & Business Media; 2013.
35. Carter DM. Cultivated positive emotions inspire environmentally responsible behaviors. *Mast Appl Posit Psychol*. 2009;2009:11.
36. Keniger LE, Gaston KJ, Irvine KN, Fuller RA. What are the benefits of interacting with nature? *Int J Environ Res Public Health*. 2013;10(3):913–935. doi:10.3390/ijerph10030913
37. Twohig-Bennett C, Jones A. The health benefits of the great outdoors: a systematic review and meta-analysis of greenspace exposure and health outcomes. *Environ Res*. 2018;166:628–637. doi:10.1016/j.envres.2018.06.030
38. McEwan K, Richardson M, Sheffield D, Ferguson FJ, Brindley P. A smartphone app for improving mental health through connecting with urban nature. *Int J Environ Res Public Health*. 2019;16(18):3373. doi:10.3390/ijerph16183373
39. Pritchard A, Richardson M, Sheffield D, McEwan K. The relationship between nature connectedness and eudaimonic well-being: a meta-analysis. *J Happiness Stud*. 2020;21(3):1145–1167. doi:10.1007/s10902-019-00118-6
40. Richardson M, Hamlin I, Butler CW, Thomas R, Hunt A. Actively noticing nature (not just time in nature) helps promote nature connectedness. *Ecopsychology*. 2022;14(1):8–16. doi:10.1089/eco.2021.0023
41. Schnell I, Harel N, Mishori D. The benefits of discrete visits in urban parks. *Urban for Urban Green*. 2019;41:179–184. doi:10.1016/j.ufug.2019.03.019
42. Hartig T. Where best to take a booster break? *Am J Prev Med*. 2006;31(4):350. doi:10.1016/j.amepre.2006.06.003
43. Korpela K, De Bloom J, Kinnunen U. From restorative environments to restoration in work. *Int Build Int*. 2015;7(4):215–223. doi:10.1080/17508975.2014.959461
44. Chang C-C, Cheng GJY, Nghiem TPL, et al. Social media, nature, and life satisfaction: global evidence of the biophilia hypothesis. *Sci Rep*. 2020;10(1):4125. doi:10.1038/s41598-020-60902-w
45. Biedenweg K, Scott RP, Scott TA. How does engaging with nature relate to life satisfaction? Demonstrating the link between environment-specific social experiences and life satisfaction. *J Environ Psychol*. 2017;50:112–124. doi:10.1016/j.jenvp.2017.02.002
46. Burchett M, Torpy F, Brennan J, Craig A. Greening the great indoors for human health and wellbeing. *Sydney*. 2010;2010:1.
47. Cleary A, Fielding KS, Murray Z, Roiko A. Predictors of nature connection among urban residents: assessing the role of childhood and adult nature experiences. *Environ Behav*. 2020;52(6):579–610. doi:10.1177/0013916518811431
48. Richardson M, Passmore H-A, Lumber R, Thomas R, Hunt A. Moments, not minutes: the nature-wellbeing relationship. *Int J Wellbeing*. 2021;11(1):8–33. doi:10.5502/ijw.v11i1.1267
49. Clayton S. Environmental identity: a conceptual and an operational definition. *Ident Nat Enviro*. 2003;2:45–65.
50. Clayton S, Karazsia BT. Development and validation of a measure of climate change anxiety. *J Environ Psychol*. 2020;69:101434. doi:10.1016/j.jenvp.2020.101434
51. Basu M, Hashimoto S, Dasgupta R. The mediating role of place attachment between nature connectedness and human well-being: perspectives from Japan. *Sustaina Sci*. 2020;15(3):849–862. doi:10.1007/s11625-019-00765-x
52. Vallerand RJ, Blanchard C, Mageau GA, et al. Les passions de l'ame: on obsessive and harmonious passion. *J Pers Soc Psychol*. 2003;85(4):756. doi:10.1037/0022-3514.85.4.756
53. Mayer FS, Frantz CM. The connectedness to nature scale: a measure of individuals' feeling in community with nature. *J Environ Psychol*. 2004;24(4):503–515. doi:10.1016/j.jenvp.2004.10.001
54. Stets JE, Biga CF. Bringing identity theory into environmental sociology. *Sociol Theory*. 2003;21(4):398–423. doi:10.1046/j.1467-9558.2003.00196.x
55. Brislin RW. *The Wording and Translation of Research Instruments*. Sage Publications, Inc; 1986.
56. Hair JF, Black WC, Babin BJ, Anderson RE, Tatham RL. Multivariate data analysis. Upper Saddle River. *Multivariate Data Anal*. 1998;5(3):207–219.
57. Lt H, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Modeling*. 1999;6(1):1–55. doi:10.1080/10705519909540118
58. MacCallum RC, Hong S. Power analysis in covariance structure modeling using GFI and AGFI. *Multivariate Behav Res*. 1997;32(2):193–210. doi:10.1207/s15327906mbr3202_5
59. Marsh HW, Hau K-T. Assessing goodness of fit: is parsimony always desirable? *J Exp Educ*. 1996;64(4):364–390. doi:10.1080/00220973.1996.10806604
60. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. *Psychol Bull*. 1980;88(3):588–606. doi:10.1037/0033-2909.88.3.588
61. McDonald RP, M-HR H. Principles and practice in reporting structural equation analyses. *Psychol Methods*. 2002;7(1):64–82. doi:10.1037/1082-989X.7.1.64

62. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *J Acad Mark Sci*. 1988;16(1):74–94. doi:10.1007/BF02723327
63. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res*. 1981;18(1):39–50. doi:10.1177/002224378101800104
64. Podsakoff PM, MacKenzie SB, Lee J-Y, Podsakoff NP. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol*. 2003;88(5):879–903. doi:10.1037/0021-9010.88.5.879
65. Iverson RD, Maguire C. The relationship between job and life satisfaction: evidence from a remote mining community. *Hum Relat*. 2000;53(6):807–839. doi:10.1177/0018726700536003
66. Davison AC, Hinkley DV. *Bootstrap Methods and Their Application*. Cambridge university press; 1997.
67. Hyvönen K, Törnroos K, Salonen K, Korpela K, Feldt T, Kinnunen U. Profiles of nature exposure and outdoor activities associated with occupational well-being among employees. *Front Psychol*. 2018;9:754. doi:10.3389/fpsyg.2018.00754
68. Busseri M, Busseri M, Sadava S, DeCourville N. A hybrid model for research on subjective well-being: examining common-and component-specific sources of variance in life satisfaction, positive affect, and negative affect. *Soc Indic Res*. 2007;83(3):413–445. doi:10.1007/s11205-006-9028-8
69. Page KM, Vella-Brodrick DA. The 'what','why'and 'how'of employee well-being: a new model. *Soc Indic Res*. 2009;90(3):441–458. doi:10.1007/s11205-008-9270-3
70. Keyes CL, Shmotkin D, Ryff CD. Optimizing well-being: the empirical encounter of two traditions. *J Pers Soc Psychol*. 2002;82(6):1007–1022. doi:10.1037/0022-3514.82.6.1007
71. Balundė A, Jovarauskaitė L, Poškus MS. Exploring the relationship between connectedness with nature, environmental identity, and environmental self-identity: a systematic review and meta-analysis. *Sage Open*. 2019;9(2):215824401984192. doi:10.1177/2158244019841925
72. Sadick A-M, Kamardeen I. Enhancing employees' performance and well-being with nature exposure embedded office workplace design. *J Build Eng*. 2020;32:101789. doi:10.1016/j.jobe.2020.101789