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Research Article

Involvement, Place attachment and Tourists' Environmentally Responsible Behaviour in Meizhou city, China

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ABSTRACT

University students are an important tourism market group. This study takes Meizhou city (a famous Hakka cultural tourism city in China) as an example to explore the influencing factors of university tourists 'environmentally responsible behavior (TERB). This study investigated 300 university students and analyzed the data by partial least squares structural equation model (PLS-SEM). The results showed that involvement positively affected place attachment (place dependence and place identity) on TERB. Among place dependence and place identity, only place identity positively affects TERB. In terms of mediating relationship, place identity plays a significant mediating role between involvement and TERB. The survey results suggest that the managers of Meizhou tourist attractions should pay more attention to the needs of college students and design participation projects that meet the needs of college students and have strong experience, so as to raise their awareness of place attachment and environmentally responsible behaviour in Meizhou. Secondly, Meizhou tourism managers should actively establish the image of tourism destination and build a good relationship between people and land. Finally, Meizhou administrative departments, tourism related departments and managers of tourist attractions should grasp the specific reasons for tourists' environmentally responsible behaviour and formulate targeted and effective tourist environmental protection policies and systems, so as to promote the sustainable development of destinations.

Keywords: Involvement; Place attachment; Place dependence; Place identity; Tourists' Environmentally Responsible Behaviour (TERB); PLS-SEM

1. Introduction

Tourism promotes the economic development, but also destroys the environment of some destinations, which brings a certain pressure to the sustainable development of tourism destinations (Li et al., 2023b).Therefore, the sustainable development of tourism has been widely concerned around the world (Han & Li, 2021). Tourists are key stakeholders in the sustainable development and environmental management of tourist destinations (Byrd, 2007). Studies have shown that tourists' environmentally responsible behaviour is an important aspect to maintain the sustainable development of tourist destinations (Chiu etal, 2014). Therefore, guiding and encouraging tourists to actively implement environmental protection behaviour is an effective means to deal with the environmental problems of tourist destinations (Chiuetal, 2014). The concept of Tourist Environmentally Responsible Behaviour (TERB) is derived from the concept of Environmentally Responsible Behaviour (ERB). It means a tourism behaviour that promotes the environmental substance of tourism destinations (Abdulsalam & Wirawan, 2023). There are many factors affecting TERB, among which the main ones are internal factors, such as environmental attitude, perceived value, subjective norms, travel experience, satisfaction, place attachment and so on (Fenget al., 2024). In terms of measurement dimension, scholars commonly choose one-dimensional model. TREB is considered a key factor in ensuring the success and sustainability of ecotourism development (Lee et al., 2013). Therefore, more and

more tourism managers and tourism researchers pay attention to this problem. The concept of involvement comes from the self-involvement theory in social psychology (Sherif & Cantril,1947) and was later applied to product involvement, social identity, consumer behaviour and tourism (Havitz & Dimanche, 1990; Xu et al., 2018; Liet al., 2023a).Tourist involvement is "a psychological state of motivation, arousal or interest between an individual and recreational activities, tourist destinations or related equipment." (Havitz & Dimanche, 1990). Kimetal. (2012) pointed out that involvement is one of the important components of memorable tourism experience, that is, the experience of tourists participating in on-site activities and planning trips. Pine and Gilmore (1999) argue that when customers are immersed in an activity, they are more likely to have a memorable experience. The study also found that involvement is a antecedent for destination satisfaction and image (Lu et al., 2015), willingness to revisit or recommend (Altunel & Erkurt, 2015), place attachment (Wang et al., 2022), and tourists' environmentally responsible behaviour (Xuetal., 2018). At present, there is no standardized and unified scale for the measurement of involvement (Li et al., 2023a).

In 1989, Williams et al. first introduced the concept of place attachment and defined it as the emotional connection between people and their place of residence (Williams et al., 1992). In 2000, Williams broadened the scope of place in his definition of place attachment to include both destination environments and individual behaviours, referring to a person's positive connection or bond with a particular place (Williams & Vaske, 2003). The division of place attachment into place identity and place dependence dimensions has been recognised by research scholars (Williams et al., 1992; Uesugi An & Kudo Yasuhiro, 2020). Place dependence refers to a functional attachment, the extent to which a particular place fulfils an individual's needs (Kyle et al., 2004). Place identity refers to an emotional attachment that emphasises the symbolic meaning and purpose given to a place (Uesugi an & Kudo Yasuhiro, 2020). Place attachment intertwines social and environmental factors and influences an individual's willingness to preserve meaningful places (Junot et al.,2018), so place attachment is an important antecedent for environmental conservation behaviour (Shen & Wang, 2023). It has been confirmed that place attachment has a significant positive effect on tourists'environmentally responsible behaviour (TERB) (Shoukat & Ramkissoon, 2022). The stronger the tourists' sense of place attachment, the more likely they are to pay attention to environmental protection and implement environmentally responsible behaviour (Zhang et al., 2023).

The recovery of China's domestic tourism industry after COVID-19 has been driven in large part by young travelers, with university students being an important part of the tourism market (Lin et al., 2022).Because university students' values and beliefs are still being formed, their concern for tourism and the environment plays an important role in the sustainable development of future tourist destinations (Linetal., 2022; Wanget al., 2023).Taking the famous Hakka cultural tourism city in China as an example and using university students from the School of Geoscience and Tourism of Jiaying University as the research subjects, this study used structural equation modelling (SEM) to analyse the relationship between university students involvement, place attachment and tourists' environmentally responsible behaviours, aiming to provide suggestions for the management of tourist behaviours and the sustainable development of tourist destinations.

2. Literature Review and Hypothesis Development

2.1 Involvement and Place attachment

It has been established that involvement in specific activities leads to a stronger place attachment (Kyle et al., 2004). People's place attachment tends to be positively correlated with their level of involvement in activities (Tao et al., 2022). Santos et al. (2017) took Porto Cellars as an example to prove that wine tourists' involvement has a significant and direct impact on place attachment in Porto wine cellars and determines their future behaviour intentions. Uesugi and Kudo (2020) argue that outdoor sports involvement can be effectively used to increase place attachment and pro-environmental behaviors when developing sustainable tourism in rural areas rich in natural resources. Wanget al. (2022) studied the relationship between virtual reality tourism involvement (VRTI) and two factors that constitute place attachment (place dependence and place identity). They found that VRTI had significant positive effects on place dependence and place identity. Tao et al. (2022) also demonstrated that leisure involvement hasa significant direct impact on place dependence and place identity. In addition, the higher the degree of geographical indication (GI) product involvement before travel, the stronger the tourist place attachment (place dependence and place identity) to the destination (Li et al., 2023a). According to the previous findings, the hypothesis is as follows: H1:Involvement positively impacts place dependence.H2:Involvement positively impacts place identity.

2.2 Involvement and Tourists' Environmentally Responsible Behavior

Involvement refers to the non-transactional cognitive, emotional and behavioral connection of tourists to the destination (Ahn & Back, 2018), which can improve the relationship between tourists and the destination environment (Zhou et al., 2020). At the same time, tourism research reveals that involvement is an important internal factor affecting tourists' environmental responsibility behaviour (Xu et al., 2018; Feng et al., 2024). For example, Lee (2011) clarified that in the behavioural model of nature tourism, recreation involvement has a significant impact on environmentally responsible behaviour (ERB), especially to the general ERB (Lee et al., 2015). Based on the participation theory, Zhou et al. (2020) constructed a

theoretical model to explain visitors' self-conscious ERB behaviour, and the results showed that tourists' involvement in destinations and scenic spots had a positive impact on their environmentally responsible behaviour. Therefore, tourists would not intentionally damage the destination, including its environment, and they were more willing to take environmental responsibility in their tourism activities. In wetland ecotourism, visitor involvement is considered to be an effective predictor of tourism experience, which in turn affects environmentally responsible behaviour (Xu et al., 2018). In terms of tourism goods, the involvement of geographical indication products also has a significant impact on tourists' environmentally responsible behaviour (Li et al., 2023a). Thus, it can be hypothesized that:

H3: Involvement positively impacts TERB.

2.3 Place attachment and Tourists' Environmentally Responsible Behaviour

Lee (2011) found that place attachment significantly and directly affects environmentally responsible behaviour, which reflects that place attachment is an antecedent for environmentally responsible behaviour. That is, as place attachment increases, so does the likelihood that recreationists will behave in an environmentally responsible manner. In island tourism, tourists'place attachment is also positively correlated with environmentally responsible behaviour (Cheng & Wu, 2015). Place dependence can significantly affect personal development and happiness, so people find ways to protect the places they depend on (Davis et al., 2009).When the potential loss or deterioration of a place poses a threat to human well-being (Schultz et al., 2000), an individual's identification with that place generates a commitment to the environment (Shen & Wang, 2023). The research results of Alonso-Vazquez et al. (2019) show that there is a significant correlation between place attachment and ERB at music festivals, and the place identity component in place attachment makes the greatest contribution to ERB at music festivals. Shenand Wang's (2023) research show that tourists' dependence on and identification with organic Agri- tourism not only guarantees a friendly environment, but also increases their confidence in protecting meaningful places.

H4: Place dependence positively impacts TERB.H5:Place identity positively impacts TERB.

2.4 The Mediating effect of Place attachment Between Involvement and Tourists' Environmentally Responsible Behaviour

Place attachment is a positive emotional connection between tourists and scenic spots (Hidalgo & Hernandez, 2001). In tourism behaviour research, some scholars use place attachment as a mediating variable to study the relationship between destination attractiveness (Li et al., 2023b), tourism experience value (Xu et al., 2022), serious leisure (Liu et al., 2024) and TERB. Destination attractiveness affects place attachment, generating a sense of responsibility, which in turn affects the fulfilment of environmental responsibility (Li et al., 2023b). Liu et al. (2024) found in their mountaineering leisure study that participants with serious leisure attributes would become attached to the destination because of its attractiveness and further promote their environmentally responsible behaviour. Li et al. (2023a) took Hangzhou West Lake Longjing Tea, a famous geographical indication (GI) product in China, as an example to confirm that the influence of GI product involvement on ERB is partly mediated by place attachment (place dependence and place identity). That is, when tourists form a strong connection between people and places through geographical indication (GI) products before arriving at their destination, they will have a better experience and a stronger place attachment and are more likely to implement environmentally friendly behaviours. In summary, this paper proposes the following hypothesis:

H6: Place dependence will mediate the relationship between involvement and TERB. H7: Place identity will mediate the relationship between involvement and TERB.

The following figure (Figure1.) summarizes the relationship among college student tourist involvement, place attachment and tourists' environmentally responsible behaviour in the form of a hypoesthesia model.

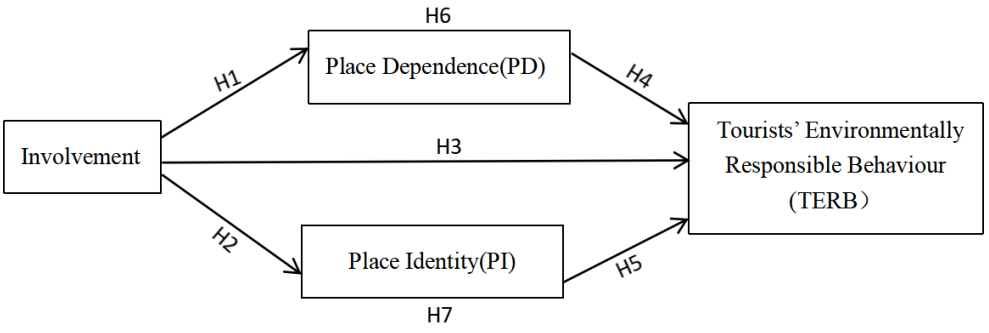

Figure1. Hypothesis model

3. Research Methodology

3.1 Study sample

In this study, college students from the School of Geoscience and Tourism at a university in southern China were used as the sample population. The reasons for this are (1) students in this School of Geoscience and Tourism have many internships and practice opportunities, and therefore have many travelling experiences. (2) College students are the main tourists in future destinations, therefore exploring TERB for tourist behaviour management is prospective. It can be seen that it is representative to explore the influencing factors of TERB with a sample of university students. In 2023, there were 1,148 students enrolled in this School of Geoscience and Tourism, and through recruitment, a total of 300 students participated in this study.

3.2 Instrument and measurement

This research questionnaire consists of four parts. The first part includes the demographic characteristics of the respondents (tourist origination, gender and grade) and tourism behaviour characteristics (tourism frequency, travel time, travel party, travel motivation, travel feelings, recommendation intention and revisit intention). The second part is the involvement evaluation. The five items in this part draw lessons from Kim et al. (2012) and Akhshik et al. (2023). The third part is the evaluation of place attachment (place dependence and place identity). Place dependence and place identity have 5 items each, referring to Williams et al. (1992) and Silva et al. (2023). The fourth part is TERB evaluation. The six projects in this part refer to Chiu et al. (2014) and Zhang et al. (2023). After the first draft of the questionnaire was completed, relevant experts were invited to review the applicability and accuracy of the questionnaire items. The questionnaire was modified according to the opinions. Parts 2, 3, and 4 are measured on a Likert-5 scale ranging from "1= strongly disagree" to "5= strongly agree."

Table1. Instrument

Variables		Items	Reference
Involvement (INV)		**INV1:**Traveling in Meizhou, I visited the places I really wanted to go.	Kim et al., 2012; Akhshik et al., 2023.
		INV2: Traveling in Meizhou, I got involved in activities I really wanted to participate in.	
		INV3: The tourist activities I experienced in Meizhou were all of my interests.	
		INV4:I really enjoyed the tourism activities I participated in in Meizhou.	
		INV5:I got involved in Meizhou tourism.	
Place attachment (PA)	Place dependence (PD)	**PA1:**No other place can compare with Meizhou.	Williams et al., 1992; Silva et al., 2023.
		PA2: Visiting Meizhou gives me more satisfaction than visiting any other place.	
		PA3: Meizhou is the best place to do what I love to do.	
		PA4:I would rather stay in Meizhou than any other tourist destination.	
		PA5: When I think of traveling, I always remember Meizhou.	
		PA6: Visiting Meizhou is part of my life.	
	Place identity (PI)	**PA7:**I have a strong sense of identity with Meizhou.	
		PA8:I am very attached to Meizhou.	
		PA9: What does visiting this place say about me as a person.	
		PA10: It is meaningful for me to visit Meizhou.	
Tourists' environmentally responsible behaviour(TERB)		**TERB1:**I will abide by the environmental protection regulations of the tourist destinations I visit.	Chiu et al., 2014; Zhang et al., 2023.
		TERB2:I will try not to destroy Meizhou's resources during my tour.	
		TERB3: When I produce garbage while traveling, I will throw it into the trash can.	
		TERB4: If there are activities to improve the environment in the destination I visit, I am willing to participate.	
		TERB5:I will try to convince others to protect the environment of the destination.	

3.2 Survey

The questionnaire was distributed and collected on the online survey platform for a week in December 2023. Atotal of 300 questionnaires were sent out, all of which were recovered with a recovery rate of 100%. Among them, there were 39 invalid questionnaires and 261 valid questionnaires, with an effective respondent rate of 87%. The criterion for determining invalid questionnaire is that the person who answered the questionnaire has no travel experience in Meizhou.

3.3 Data analysis

After the questionnaires were collected, the valid questionnaires were entered into SPSS 23.0 for respondents'

demographic profile and tourism behaviour characteristics analysis. Finally, the reliability and validity, the relationship between involvement, place attachment (place dependence and place identity) and tourists' environmentally responsible behaviour (TERB) was examined using structural equation modelling (SEM) with Smart PLS4.

4. Results

4.1 Respondents demographic profile and tourism behaviour characteristics

Among the 261 respondents (Table2), those from Meizhou accounted for 18.8%, those from Pearl River Delta accounted for 25.3%, those from Chaoshan region accounted for 12.3%, those from other regions in Guangdong Province accounted for 33.3%, and those from regions outside Guangdong Province accounted for 10.3%. Among them, more female (52.6%) than male (47.4%). The proportion of respondents in fresher's year was the smallest, accounting for 19.9%, and the proportion in other grades was similar. In Meizhou, 25.7% of the respondents participated in one-time trip, and the largest number of respondents participated in more than four times trips, accounting for 35.2%. In terms of travel time, the number of people traveling in the last half year is the largest, accounting for 71.6%. Student tourists are satisfied with Meizhou. More than 70% of student tourists are willing to recommend to others and revisit Meizhou.

Table 2. Respondents demographic profile and tourism behaviour (N = 261)

Characteristics		**Frequency**	**Peentage**
Origination	Meizhou	49	18.8
	Pearl River Delta	66	25.3
	Chaoshan	32	12.3
	Other regions in Guangdong Province	87	33.3
	Outside Guangdong Province	27	10.3
Gender	Male	108	41.4
	Female	153	58.6
Grade	Fresher	52	19.9
	Sophomore	68	26.1
	Junior	67	25.7
	Senior	74	28.4
Travel frequency	1time	67	25.7
	2times	47	18.0
	3times	40	15.3
	4times	15	5.8
	More than 4 times	92	35.2
Travel time	In Six months	187	71.6
	Six months ago	34	13.0
	One year ago	19	7.3
	Two years ago	13	5.0
	Three years ago	2	0.8
	Four years ago	6	2.3
Travel feelings	Strongly satisfied	50	19.2
	Satisfied	124	47.5
	neutral	83	31.8
	Not satisfied	4	1.5
	Not satisfied strongly	0	0
Recommendation intention	Yes	186	71.3
	No	75	28.7
Revisit intention	Yes	206	78.9
	No	55	21.2

4.2 Assessment of the measurement model

4.2.1 Reliability of the measurement model

According to Table3, the indicator loadings of all the items were greater than 0.7, Cronbach's alpha and CR values of the constructs surpassed 0.8, thus meeting the threshold suggested by Hair et al. (2011, 2021). So, no item is deleted and it implies sound internal consistency (Fornell & Larcker, 1981).

Table 3. Results of reliability loading, CR and VIF for constructs

Variables		Items	Cronbach's alpha	CR	AVE	Loading	VIF
Involvement (INV)		INV1	0.937	0.938	0.800	0.900	3.521
		INV2				0.912	4.033
		INV3				0.882	3.081
		INV4				0.911	3.819
		INV5				0.867	2.694
Place attachment (PA)	Place dependence (PD)	PA1	0.934	0.937	0.792	0.883	3.365
		PA2				0.908	3.782
		PA3				0.903	3.410
		PA4				0.892	3.316
	Place identity (PI)	PA5	0.908	0.914	0.731	0.861	2.641
		PA6				0.84	2.849
		PA7				0.87	3.648
		PA8				0.851	2.882
		PA9				0.871	3.127
		PA10				0.84	2.737
Tourists' environmentally responsible behaviour(TERB)		TERB1	0.915	0.917	0.749	0.852	2.823
		TERB2				0.902	4.292
		TERB3				0.905	4.312
		TERB4				0.887	3.064
		TERB5				0.775	1.894

Notes: CR = composite reliability ; AVE= average variance extracted; VIF=Variance Inflation Factor

4.2.2 Validity of the measurement mode

Average variance extracted (AVE) is used to measure convergence validity. From Table2, all AVE values are higher than the suggested values of 0.50 (Fornell & Larcker, 1981), which is considered that the convergence validity of the measurement model is satisfactory. Cross-loadings, Fornell-Larcker criterion and Heterotrait monotrait ratio (HTMT) are three commonly used methods for measuring discriminant validity (Hair et al, 2017). Table4 shows that the load of an indicator on the relevant facet is greater thanits load on all other facet, supporting the adequacy of the discriminant validity of the measurement model(Hair et al, 2017).The results of Fornell-Larcker criterion (Table5) mean that the square root of AVE of all constructs is higher than the correlation coefficient between constructs, indicating that all constructs have good discriminative validity (Fornell & Larcker, 1981).In attention, all HTMT values are less than0.90 (Table6), meeting the criteria for evaluating discriminative validity with HTMT ratios < 0.90 by Henseleret al. (2014). In conclusion the discriminant validity of this study is also satisfactory.

Table 4. Results of Cross-Loadings

Items	INV	PD	PI	TERB
INV1	**0.900**	0.617	0.663	0.271
INV2	**0.912**	0.587	0.670	0.338
INV3	**0.882**	0.591	0.597	0.274
INV4	**0.911**	0.580	0.648	0.379
INV5	**0.867**	0.608	0.679	0.296
PA1	0.546	**0.883**	0.657	0.034
PA2	0.628	**0.908**	0.679	0.101
PA3	0.628	**0.903**	0.745	0.097
PA4	0.563	**0.892**	0.743	0.028
PA5	0.594	**0.861**	0.753	0.114
PA6	0.599	0.701	**0.840**	0.217
PA7	0.598	0.730	**0.870**	0.152
PA8	0.588	0.766	**0.851**	0.122
PA9	0.652	0.670	**0.871**	0.327
PA10	0.663	0.599	**0.840**	0.404
TERB1	0.262	0.062	0.255	**0.852**
TERB2	0.251	-0.019	0.201	**0.902**
TERB3	0.250	0.025	0.215	**0.905**
TERB4	0.379	0.153	0.317	**0.887**
TERB5	0.354	0.143	0.297	**0.775**

Notes: INV = involvement; PA= place attachment; PD=place dependence; PI=place identity; TERB=tourists' environmentally responsible behaviour.

Table 5. Results of Fornell-Larcker criterion

Variables	INV	PD	PI	TERB
INV	0.894			
PD	0.667	0.890		
PI	0.729	0.805	0.855	
TERB	0.349	0.086	0.299	0.865

Notes: INV = involvement; PA= place attachment; PD=place dependence; PI=place identity; TERB=tourists' environmentally responsible behaviour.

Table 6. Results of Heterotrait monotrait ratio (HTMT)

Variables	INV	PD	PI	TERB
INV				
PD	0.711			
PI	0.785	0.879		
TERB	0.373	0.111	0.312	

Notes: INV = involvement; PA= place attachment; PD=place dependence; PI=place identity; TERB=tourists' environmentally responsible behaviour.

4.3 Assessment of the structural model

4.3.1 Multicollinearity assessment

The Variance Inflation Factor (VIF) is used to diagnose multicollinearity. The results in Table2 show that VIF values are all less than 5, which conforms to the standard of VIF less than 5 proposed by Haenlein and Kaplan (2004), that is,VIF less than 5 indicates that there is no multicollinearity.

4.3.2 Explanatory power and model fit assessment

Scholars believe that the larger the coefficients of determination (R^2), the better the model fit. R^2 values between 0.19 and 0.33 indicate a weak fit, between 0.33 and 0.67 indicate a moderate fit, and greater than 0.67 indicate a strong fit. According Figure2, the R^2 values are 0.445,0.532 and 0.218,which reflect the model well. Referring to Cohen's (1988) criteria for effect sizes for R^2 (f^2) (small: 0.02; medium: 0.15; substantial: 0.35), involvement had a large effect (f^2 = 0.802,1.136) on place defense and place identity and had a small effect (f^2 = 0.078) on TERB (Table7). Meanwhile place defence and place identity had a small effect (f^2 = 0.118,0.074) on TERB (Table7). According to Blindfolding procedure, construct cross-validated redundancy value (Q^2) is mostly greater than 0 (Table8), indicating that exogenous variables can better predict endogenous variables (Chenet al., 2022). Table9 shows the results of model fit meet the criteria. Therefore, the model is considered to have a good fit.

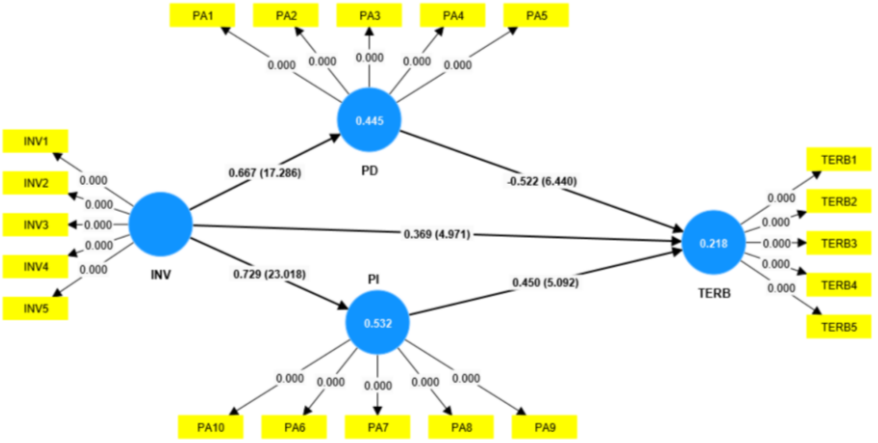

Figure 2. The structural model

Table7. Results of f^2

Variables	INV	PD	PI	TERB
INV		0.802	1.136	0.078
PD				0.118
PI				0.074
TERB				

Notes: INV = involvement; PA= place attachment; PD=place dependence; PI=place identity; TERB=tourists' environmentally responsible behaviour.

Table8. Results of Q^2

Variables	SSO	SSE	Q^2 (=1-SSE/SSO)
INV	1305	1305	0
PD	1305	854.034	0.346 0.38
PI	1305	809.308	0.159
TERB	1305	1097.724	

Notes: INV = involvement; PA= place attachment; PD=place dependence; PI=place identity; TERB=tourists' environmentally responsible behaviour.

Table 9. Results of model fit

	Saturated model	Criteria	Source
SRMR	0.068	<0.08	Hu & Bentler, 1999
Chi-square	643.037	The smaller, the better	McHugh,2013
NFI	0.87	>0.8	Ullman, 2001

Notes: INV = involvement; PA= place attachment; PD=place dependence; PI=place identity; TERB=tourists' environmentally responsible behaviour.

4.3.3 Hypothesis testing

The hypothesis significance of the structural model was tested by 5000 iterations of bootstrapping program. Table10 and Figure3 present the results of the hypotheses tests. Specifically, INV positively affects PD (β=0.667, t = 17.286, p < 0.001) , PI (β = 0.729, t = 23.018, p < 0.001) and TERB (β= 0.369, t=4.79, p < 0.001) thus supporting H1-H3. PD doesn't positively affect TERB (β= -0.522, t =6.44, p < 0.001), so rejecting H4. But PI positively affects TERB (β=0.45, t =5.092, p < 0.001) ,hence supporting H5. The mediationtest results are also presented in Table10. In the influence path of "INV→PD→TERB"the β is -0.348, suggesting that PD doesn't mediate the effect of INV on TERB, thus rejecting H6. Furthermore, in the influence path Of'INV→PI→TERB" Tis 4.927***, indicating that PI mediate the effect of INV on TERB, hence supporting H7.

Table10. Results of hypothesis test

Hypothesis	Path coefficient	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Outcome
H1:INV -> PD	0.667	0.668	0.039	17.286	0	Support
H2:INV -> PI	0.729	0.73	0.032	23.018	0	Support
H3：INV -> TERB	0.369	0.371	0.074	4.971	0	Support
H4:PD -> TERB	-0.522	-0.527	0.081	6.44	0	Reject
H5:PI -> TERB	0.45	0.452	0.088	5.092	0	Support
H6:INV -> PD ->TERB	-0.348	-0.352	0.061	5.682	0	Reject
H7：INV -> PI -> TERB	0.328	0.33	0.067	4.927	0	Support

Note : ***p < 0.001 ; T>1.96.

5. Discussion and implications

Different tourist groups have different behaviours. This study explores the influencing factors of university students' environmentally responsible behaviours, and the results reveal the relationship between university students' involvement, place attachment and environmentally responsible behaviours. First of all, this study shows that the involvement of college tourists will positively affect their place attachment (place dependence and place identity) and environmentally responsible behavior towards the tourist destination, which echoes previous studies (Wang et al., 2022; Zhou et al., 2020) and extend the robustness of this relationship to the group tourism consumption of college students. In this regard, the survey results suggest that the managers of Meizhou tourist attractions should pay more attention to the needs of college students and design participation projects that meet the needs of college students and have strong experience, so as to raise their awareness of place attachment and environmentally responsible behaviour in Meizhou.

Second, the results of this study show that place identity in place attachment has a positive effect on tourists' environmentally responsible behavior, while place dependence does not. This is consistent with previous research (Shen & Wang, 2023), suggesting that place identity is a valid predictor of TERB. Specifically, if college visitors have a strong sense of place identity with the destination, they will be more concerned about environmental issues and have a stronger responsibility to act environmentally. Therefore, Meizhou tourism managers should actively establish the image of tourism destination and build a good relationship between people and land.

Thirdly, the mediation analysis shows that place identity plays a mediating role between tourist involvement and TERB. This is consistent with the findings of Li et al. (2023a), who found that place identification with a product's origin is a mediating variable for GI product engagement and environmentally friendly behaviour. Specifically, the participation of college tourists promotes their local identity, thereby reinforcing their environmentally responsible behaviour. As a result, college tourists will have a stronger intention to protect the environment when they travel. In this regard, Meizhou administrative departments, tourism related departments and managers of tourist attractions should grasp the specific reasons for tourists' environmentally responsible behavior and formulate targeted and effective tourist environmental protection policies and systems, so as to promote the sustainable development of destinations.

6. Limitations and Future Research Recommendations

The study has several limitations that need to be explored further. First, in terms of research samples, this study only takes the School of Geography Science and Tourism of Jiaying College in Meizhou City as samples to investigate the environmental responsibility behaviours of college tourists and their influencing factors. Future studies will expand the sample to other universities to improve the rationality of the research conclusions. Second, in terms of research methods, this study only adopts quantitative research methods to obtain questionnaire data through specific objects. Future research can be analyzed using qualitative research methods such as in-depth interviews and grounded theory to deepen understanding of the research. Third, in terms of research scale, only 5 items were adopted in this study to measure tourist involvement behaviour, which may not be enough to correctly explain tourist involvement behavior. Future studies should use more dimensions and items to measure comprehensively. Fourth, in terms of research variables, this study selects independent variables, dependent variables and intermediate variables to build a framework model. The environmental behaviour of different cultural backgrounds is different, and future studies are encouraged to choose cultural background as the moderating variable to verify the framework model, so as to improve the depth of research.

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