

*This is an Accepted Manuscript of an article published by Taylor & Francis in **Journal of Sustainable Tourism** on 26 August 2022, available at:*

<https://www.tandfonline.com/doi/full/10.1080/09669582.2022.2116643>

From ownership to responsibility: Extending the theory of planned behavior to predict tourist environmentally responsible behavioral intentions

Abstract

This research adopts the view that tourists can feel destinations belong to them emotionally (destination psychological ownership). An ownership route for promoting tourist environmentally responsible behavioral intentions is examined (TERBI) based on the theory of planned behavior, with perceived environmental responsibility and place attachment as mediators. Data were collected from two samples in Hangzhou: Gen Z ($n = 549$) and older generations ($n = 547$). The results showed that destination psychological ownership is not directly related to TERBI; perceived environmental responsibility and place attachment mediate the relationship between destination psychological ownership and TERBI. Place attachment is the most critical mediating variable. The levels of TERBI are significantly lower among Gen Z tourists; however, the effect of subjective norms on TERBI is stronger for Gen Z than for other generations. This research provides theoretical and managerial implications to understand better the role of destination psychological ownership in facilitating TERBI.

Keywords: Tourist environmentally responsible behavior (TERBI); theory of planned behavior (TPB); destination psychological ownership; perceived environmental responsibility; place attachment; Generation Z

1. Introduction

Sustainable tourism development needs to weigh the social, economic, cultural, and environmental benefits against the costs of tourism development (Hall, 2019). However, research suggests that the tourism sector is falling somewhat behind in realizing its potential to achieve the Sustainable Development Goals (SDGs) (e.g., Hall, 2019; Scott et al., 2016, 2019; Seyfi et al., 2022), and primarily SDG 15 (i.e., protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) to ensure environmental protection. Environmental protection in tourism destinations is critical for sustainable tourism development (Qiu et al., 2022b). Since negative environmental consequences on destinations are partially caused by tourist behavior (Wu et al., 2021b), changing adverse behaviors into sustainable ones can have critical impacts on the environmental sustainability of tourism (Dolnicar et al., 2019). Therefore, this raises the question of how to mitigate adverse behaviors better and promote environmentally responsible behaviors (Su & Swanson, 2017).

The previous literature has paid considerable attention to the antecedents of tourist environmentally responsible behavioral intentions (hereafter, TERBI) (e.g., Wang et al., 2020). Various guiding frameworks, such as the theory of planned behavior (TPB), norm activation model (NAM), and value-belief-norm theory (VBN), are extensively applied to understand the characteristics of TERBI (e.g., Qiu et al., 2018). Among these theories, TPB is one of the most prominent and widely used social-psychological models for explaining focal behaviors (e.g., Loureiro et al., 2022; Zheng et al., 2022). Despite an extensive application of TPB, researchers, including its founder Ajzen (1991), have underlined that the theory is open for model extension, either by introducing additional predictors or modifying causal links in specific scenarios. The validity of extending TPB with other theories (e.g., NAM or VBN) or variables in predicting specific behaviors is widely supported (e.g., Han & Hyun, 2017; Woosnam et al., 2022).

While this stream of scholarly investigations is insightful, TERBI research to date follows a host-guest dichotomy embedded in the dominant paradigm of tourism research (Bimonte & Punzo, 2016). Tourists are generally treated as *guests* who travel away from

home to the *host* destination, usually for hedonic purposes (Qiu et al., 2022b). Under this paradigm, scholars focus more on intervention factors or message frames that promote voluntary yet often *reactive* actions to protect natural environments when being a destination guest (e.g., Liu et al., 2019; Su & Swanson, 2017). However, a new understanding of tourists as invited hosts should be adopted to facilitate their *proactive* uptake of TERBI. By “invite hosts,” tourists develop a mindset that the destination is treated as psychologically “mine” (Zhang & Xu, 2019).

The nascent literature applies the psychological ownership concept from the organizational setting to the tourism sphere and proposes a novel concept, i.e., destination psychological ownership, to capture tourists’ sense of ownership of destinations (e.g., Li et al., 2020). This ownership route to promote TERBI is essential given that people will be more proactive in engaging in environmental actions when they feel psychological ownership in destinations (Wang et al., 2022). Supporting this theoretical argument, Li et al. (2020) found that destination psychological ownership relates positively to pro-environmental behaviors. Although TPB is predominately a rationally driven model, it is crucial to consider emotional factors as well. Therefore, destination psychological ownership (i.e., the destination is perceived as emotionally mine) might be an effective supplement to the TPB in explaining TERBI.

An unresolved issue is to explore how destination psychological ownership might leverage its power in eliciting TERBI (Li et al., 2020). Some prior studies in other research domains suggest the potential mediating roles of perceived responsibility and place attachment. Peck et al. (2021) found that the impact of priming people’s psychological ownership toward nature-enhanced stewardship efforts toward public goods was mediated by consumers’ perceived responsibility toward the environment. Zhang and Xu (2019) demonstrated that residents’ protective behavior is indirectly influenced by destination psychological ownership via the mediation of place attachment. Therefore, it is worthwhile to consider whether perceived environmental responsibility and place attachment also mediate the link between destination psychological ownership and subsequent TERBI.

Additionally, levels and predictors of TERBI may differ between Generation Z (Gen Z) and older generations. Gen Z includes people born between 1995 and 2009 (Goh & Lee,

2018), while older generations are individuals born before 1995. The intent in this research was to capture the unique TERBI attributes of Gen Z compared to other generations. Gen Z members are assumed to have a keen interest in sustainable development and social responsibility and tend to get more involved in environmental protection activities (Dabija et al., 2020). The specific question to be addressed is: Are there significant differences between Gen Z and older generations regarding levels of TERBI and its antecedents?

To address the literature gaps, this research: 1) examined how destination psychological ownership exerts an impact on TERBI via an extended TPB model; 2) tested the mediating roles of perceived environmental responsibility and place attachment; and 3) explored whether there are differences in the magnitude and predictors of TERBI between Gen Z and older generations. The findings reveal how an ownership route (destination psychological ownership) functions to cultivate TERBI. They offer practical implications for destination managers in appealing to destination ownership feelings, promoting sustainable tourism, and achieving sustainable development goals.

2. Literature review and hypothesis development

2.1. Tourist environmentally responsible behavior (TERB)

Environmentally responsible behavior is also labeled as pro-environmental, environmentally friendly, eco-friendly, or green (Kiatkawsin & Han, 2017). Despite the different wording, these concepts are used interchangeably, with a common emphasis on individuals' positive behaviors that contribute to protecting the natural environment (Qiu et al., 2018; Wang & Zhang, 2020). Environmentally responsible behavior represents tourist actions that either reduce or avoid the destruction of environmental resources in destinations (Su et al., 2020). Scholars have utilized numerous theoretical frameworks, including the theory of planned behavior (TPB), norm activation model, value-belief-norm theory, place attachment theory, and stimulus-organism-response theory (Qiu et al., 2018; Wu et al., 2021a); among which, TPB is one of the most frequently applied frameworks to explain and understand predictors of TERB (e.g., Esfandiar et al., 2022; Zheng et al., 2022).

2.2. Theory of planned behavior

The theory of planned behavior (TPB) originally stems from the theory of reasoned action

and has been widely applied to explore various individual behaviors (Erul & Woosnam, 2022). An individuals' behavioral intentions are a central factor in the basic TPB model (Erul et al., 2020), in which three influential independent predictors (attitudes toward the behavior, subjective norms, and perceived behavioral control) (Ajzen, 1991). TPB and its expanded models have been successfully examined in a series of tourism contexts (Erul et al., 2020; Wang et al., 2020). TPB is the most frequently used theory in previous articles on pro-environmental behavior (Loureiro et al., 2022). Accordingly, this research uses TPB as an essential and feasible theoretical framework for predicting TERBI.

2.3. Links among constructs within the theory of planned behavior

Attitudes toward a behavior are "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p.188). The link between attitudes toward behavior and behavioral intentions has been widely supported in prior studies (Erul & Woosnam, 2022). This logic can be explained as follows: a favorable attitude derived from clear expectations generates a positive motivation influencing specific behavioral intention, whereas unfavorable expectations lead to avoidance of behavioral intentions (Wong et al., 2021). Attitudes toward the behavior are an influential antecedent of tourist pro-environmental behavioral intentions (Han, 2015). Therefore, this study hypothesized that:

H₁: Attitudes toward a behavior directly and positively influence TERBI.

Subjective norms are "the perceived social pressure to perform or not to perform the behavior" (Ajzen, 1991, p.188). They represent socially acceptable behaviors or normative beliefs that community members consider valid and conventional (Wong et al., 2021). Individuals are inclined to adhere to subjective norms by listening to and acting according to ideas from others (Meng & Choi, 2016) because subjective norms reflect things that are acceptable, right, and of good value amongst social referent groups. These normative influences often stem from people who are known and influential, including family, friends, and colleagues. Subjective norms are important predictors of people's behavioral intentions (Ajzen, 1991). For example, tourists' pro-environmental behavior intentions can be explained by subjective norms (Wang et al., 2020). Accordingly, this study hypothesized that:

H₂: Subjective norms directly and positively influence TERBI.

Perceived behavioral control is "the perceived ease or difficulty of performing the behavior" (Ajzen, 1991, p.188). It reflects personal assessments of the resources or opportunities in the form of experiences, challenges, and difficulties in adopting a specific behavior (Ajzen, 1991). Perceived behavioral control plays a vital role in the decision-making process, as intentions to perform certain behaviors depend somewhat on the sufficiency of resources or opportunities one has (Meng & Choi, 2016). A positive link between perceived behavioral control and pro-environmental behavioral intentions is supported in contexts of a green lodging and environmentally responsible museums (Han, 2015; Han & Hyun, 2017). This study assumed that:

H₃: Perceived behavioral control directly and positively influences TERBI.

2.4. Extended TPB model with destination psychological ownership

Although TPB has been successfully applied to various human behaviors in tourism, given that the TPB framework is a rational decision-making model (Qiu et al., 2018), there is still room for the improvement of the explanatory power in explaining specific behaviors and intentions such as TERBI (Han & Hyun, 2017). The concept of psychological ownership could be a worthwhile consideration.

Psychological ownership is the "state in which individuals feel as though the target of ownership or a piece of it is 'theirs'" (Pierce et al., 2001, p. 299). Pierce et al. (1991) developed the psychological ownership-attitude-behavior model (hereafter, PAB) to stress that individuals with psychological ownership in an organization show more positive attitudes and, thus, behaviors toward the organization. The PAB model has been verified in predicting residents' place citizenship behavior (Zhang & Xu, 2019). However, this model has rarely been applied to tourist environmentally responsible behavior. Psychological ownership affects human behaviors in various contexts and helps contribute to organizational citizenship behavior (Van Dyne & Pierce, 2004). Destination psychological ownership is a critical predisposing variable for tourist environmentally responsible behavior (Li et al., 2020).

Destination psychological ownership describes ownership feelings toward a destination

(Kumar & Nayak, 2019). It is an essential factor in explaining TERBI. When tourists feel that they are the “psychological owners”, the destination is regarded as an extended part of the self (Pierce et al., 2003). Altruistic pro-environmental behaviors toward the destination might also be perceived as self-directed, i.e., benefits of environmental actions or costs of inactions might be redirected back to the self because the destination is also "mine," even if in a psychological sense. Accordingly, as invited hosts, tourists are likely to assume the responsibility of protecting the destination's natural environment (Li et al., 2020). Therefore, exploring the effect of destination psychological ownership on TERBI using the PAB model may be fruitful. However, few studies have endeavored to integrate the TPB and PAB models as a theoretical framework to enhance model sufficiency. This research combined these two theories to understand TERBI better. Therefore, it was proposed that:

H4: Destination psychological ownership directly and positively influences TERBI.

The PAB model indicates that psychological ownership of an organization triggers more positive attitudes (Pierce et al., 1991). Wang and Chen (2005) found that an ownership mindset toward an organization positively affected employee working attitudes. In marketing research, psychological ownership is found to be a significant antecedent of attitudes toward products (Pick, 2021). For tourists, feelings of psychological ownership toward a specific destination are expected to translate into positive attitudes to engaging in environmentally responsible behavior. Tourists may be inclined to have more favorable attitudes toward issues related to the destination when they feel they are psychological hosts of that destination.

Thus, it was expected that:

H5: Destination psychological ownership directly and positively influences attitudes toward the behavior.

2.5. Perceived environmental responsibility within the PAB model

The importance of destination psychological ownership has been established, yet little investigation has explored the mediating variables between destination psychological ownership and TERBI (Li et al., 2020). Special attention should be paid to uncovering these relationships to understand better how destination psychological ownership influences TERBI.

Perceived environmental responsibility is a sense of responsibility to take measures to solve environmental problems (Sheng et al., 2018). The role of perceived environmental responsibility in inducing people's behavior needs to be evaluated. This might hold the key for policymakers to drive environmentally responsible behavior by increasing individuals' perception that they should consider environmental responsibility in their actions (Kollmuss & Agyeman, 2002). This felt responsibility could be critical for translating motivations into actual actions (Punzo et al., 2019). Prior studies demonstrate that perceived environmental responsibility is a predictor of green purchasing behavior (Lee, 2008) and ecological, environmental behavior (Lu et al., 2021). Thus, the stronger people perceive environmental responsibility during traveling, the more likely they are to engage in environmentally friendly behaviors and accordingly:

H₆: Perceived environmental responsibility directly and positively influences TERBI.

The cognition-attitude-behavior model (CAB) follows the general rules of cognitive processing to explain human behavioral decision-making (Deng et al., 2018). Individuals' cognition of specific issues activates the formation of related attitudes; these attitudes, in turn, could result in specific behavioral intentions. According to the CAB model, perceived environmental responsibility as the belief that individuals should shoulder the obligation to protect nature could lead to favorable attitudinal evaluations (e.g., protecting nature is wise and beneficial). Stronger perceived environmental responsibility could facilitate more favorable environmental attitudes (Paco & Rodrigues, 2016). Previous studies support this argument; for instance, perceived environmental responsibility positively impacted guest attitudes toward green lodging (Patwary et al., 2021). Thus, it was proposed that:

H₇: Perceived environmental responsibility directly and positively influences attitudes toward the behavior.

Psychological ownership lies in the feeling of ownership of an object (tangible or intangible) (Pierce et al., 2001). One of the fundamental outcomes of ownership feelings is a sense of responsibility (Van Dyne & Pierce, 2004). Psychological ownership can result in the sense of responsibility toward an object (Pierce et al., 2003). People will want to take responsibility for maintaining or nurturing the ownership object simply because it is theirs

(Wang et al., 2022). When a tourist forms a sense of psychological ownership for a specific destination, a sense of responsibility toward this destination is evoked (Li et al., 2020). However, no study has explored the relationship between psychological ownership and perceived environmental responsibility in a destination context. This paper posited that:

H₈: Destination psychological ownership directly and positively influences perceived environmental responsibility.

2.6. Place attachment within the PAB model

The bond between individuals and places is commonly recognized as place attachment (Ramkissoon et al., 2013; Woosnam et al., 2018). Prior researchers have agreed on the critical role place attachment plays in tourist loyalty (Xu & Zhang, 2016) and pro-environmental behavioral process (Qiu et al., 2018). Based on a systematic literature review, Esfandiar et al. (2022) found that place attachment was influential in explaining pro-environmental behaviors within protected natural areas. When tourists are positively attached to a specific destination, they tend to be more environmentally friendly during travel (Qiu et al., 2022b). The following hypothesis was thus predicted:

H₉: Place attachment directly and positively influences TERBI.

This current research also argues that place attachment can contribute to attitudes toward behavior for the following reasons. The emotional ties derived from place attachment could elicit greater empathy, provoking altruistic attitudes toward destination protection (Qiu et al., 2022b). Tourists who identify strongly with the place could transfer what they love to the specific destination, expressing positive attitudes toward the destination, including favorable attitudes toward protecting the natural environment (Qu et al., 2019). Previous empirical studies showed that tourist attitudes toward protecting the environment are aroused by place attachment (e.g., Qiu, 2017). Given this evidence, the following hypothesis was proposed:

H₁₀: Place attachment directly and positively influences attitudes toward the behavior.

Place attachment can be a function of destination psychological ownership. The “mere ownership effect” indicates that people are generally more attached to objects they feel ownership of than similar objects without (psychological) ownership (Beggan, 1992). People are likely to exhibit high-level attachment for objects they have feelings of ownership (Peck

& Shu, 2009). Evidence for the association between psychological ownership and attachment is empirically identified in marketing research (Kamleitner & Feuchtl, 2015). A recent study demonstrated that if residents perceive a specific destination as psychologically theirs, they will exhibit a high-level attachment to that place (Zhang & Xu, 2019). Thus, it is reasonable to predict that ownership feelings toward the destination will result in stronger attachment.

H₁₁: Destination psychological ownership directly and positively influences place attachment.

Generation theory presumes that cohort differences can be generalized to the mean cohort level of each generation for a better understanding of the profile and characteristics of prototypical individuals (Twenge et al., 2010). Gen Z, unlike their parents and older siblings, exhibits different behaviors. They are tech-savvy, greener, and more oriented toward sustainability issues; for example, they prefer those companies and brands that can connect with their psyches and enhance their experiences and feelings (Dabija et al., 2019). However, there are some contradictory findings. For instance, Parzonko et al. (2021) reported that Gen Z was less engaged in pro-environmental behavior compared to older generations. Accordingly, Gen Z appears to behave differently from previous generations, yet this difference might change in specific situations. This research proposed that:

H₁₂: Levels and predictors of TERBI between Gen Z and older generations are significantly different.

This research further proposes within the PAB model that destination psychological ownership exerts an impact on TERBI through the mediation of attitudes toward the (environmental) behavior. The underlying logic is that when tourists feel ownership for the destination (i.e., this destination is “mine”), they tend to hold positive attitudes toward issues related to the destination (e.g., favorable attitudes toward protecting the destination environment) (Van Dyne & Pierce, 2004). These favorable attitudes will subsequently encourage the uptake of TERBI while traveling in the destination. In addition, according to psychological ownership theory, ownership is imbued with a sense of responsibility to nourish the ownership object (Pierce et al., 2001, 2003). When tourists feel they are invited by the destination hosts (i.e., destination psychological ownership), they will be more

motivated to shoulder personal responsibility for protecting the destination and hold more favorable attitudes to activate TERBI. Based on the “mere ownership effect” (Beggan, 1992), tourists will be more attached to the destination if they feel ownership of that destination. This attachment will translate into positive attitudes since the destination is treated as an extended self (i.e., everything that happens to the destination would be related to the self), and this self-relevance can subsequently make tourists more committed to engaging in TERBI. Based on the above considerations, Figure 1 details the proposed conceptual model.

[Insert Figure 1 here]

3. Method

3.1. Measurement of constructs

A cross-sectional survey was used for data collection, including multi-item scales to measure each construct. Validated scales from the prior literature were identified and modified to fit the research setting (see Appendix A for details). Except for demographic variables, all other measurement items were tested on five-point Likert-type scales, anchored from “strongly disagree” (1) to “strongly agree” (5).

3.2. Measurement pretest

The translation and back-translation techniques between English and Chinese were applied to improve the survey quality (Qiu et al., 2022a). A pilot test of the measurement items was performed before the large-scale survey. Two types of validity measures in the pre-test phase, covering content and construct validity, were evaluated. Concerning content validity, the scale was reviewed by a panel of experts composed of three tourism scholars and three destination managers. The panel judged the survey instrument's relevancy, clarity, and suitability to check and improve the content validity of instruments (Su et al., 2020).

To further ensure that the instrument items were designed without ambiguity and comprehended by the target respondents, a pre-test was performed with 120 tourists who had previous travel experience to the destination of this research. They rated all items and provided feedback to improve the scale. Regarding construct validity, results of an exploratory factor analysis showed that each item's standard factor loading was greater than 0.5 ($p < 0.001$), denoting acceptable levels of construct validity (Su et al., 2018a).

Additionally, pilot testing demonstrated that each item should be retained due to acceptable Cronbach's alphas (all > 0.7) (Su & Swanson, 2019).

3.3. Data collection and sample characteristics

Hangzhou, known as "the Oriental leisure capital and the city of life quality," was not only the host city of the 2016 G20 Summit but also the 2022 Asian Games. Hangzhou is a popular urban tourism destination due to its most famous attractions, including West Lake (a world heritage cultural landscape site), Beijing-Hangzhou Grand Canal (a world cultural heritage site), and Xixi National Wetland Park (Chinese national wetland park). Accordingly, Hangzhou was selected as the destination for this research, and the above-mentioned three representative attractions were chosen for data collection.

Two sets of data were collected in Hangzhou from October to November 2021 to obtain the samples of Gen Z and older generations sequentially. Millions of tourists visit Hangzhou annually (Qiu et al., 2022b), so it is almost impossible to perform a real random sampling procedure on this large population (Meng & Choi, 2016). Instead, a convenience sampling procedure was adopted, following its wide use for data collection in the tourism literature (e.g., Li et al., 2020; Qiu et al., 2022a; Su & Swanson, 2017).

Specific to the Gen Z sample, four trained research assistants from a local university helped facilitate the survey administration. The screening criterion was used whereby research assistants approached potential participants to ask whether they were born between 1995 and 2009; if yes, the research assistants informed people of the aim of this anonymous survey. Participants provided oral consent before taking part in the survey. In all, 600 Chinese domestic tourists (Gen Z) participated, and all returned the questionnaire, among which 549 valid forms were then identified, resulting in a 91.5% valid rate.

Subsequently, a similar data collection procedure was used for the older generations, except those potential participants were asked whether they were born before 1995 and presented with the questionnaire after gaining oral informed consent. Considering that the statistical power of the group-comparison hypothesis test is highest when groups have equal/balanced sample sizes (Rusticus et al., 2014), the research team again distributed and collected back the survey from 600 Chinese domestic tourists (older generations), among which 547 valid forms were obtained, a 91.2% valid rate.

Despite using the convenience sampling procedure, the participant characteristics of this study (see Appendix B) matched the profiles of many other studies conducted in the same destination (Qiu et al., 2022b; Zhou et al., 2020). This demographic alignment indicated that the sample has good representativeness of the tourist population of Hangzhou. In sum, a sample with 1,096 valid responses were received, including Gen Z ($n = 549$) and older generations ($n = 547$). These sample sizes are large enough to conduct confirmatory factor analysis and structural equation modeling based on the criteria of Wolf et al.'s (2013) Monte Carlo simulations.

Before conducting the formal data analyses, the data set was evaluated for normality. The results showed that the absolute skewness and kurtosis values for the scale items ranged from -1 to $+1$, meeting the skewness and kurtosis requirements (Hair et al., 2009). The Henze-Zirkler multivariate normality test was applied to determine if the data were normally distributed. The results showed that the data were multivariate normal ($HZ = 1.03, p = 0.49$). The data were thus appropriate for further analysis by AMOS.

4. Results

4.1. Common method variance test

Common method variance (CMV) was checked through Harman's single-factor test and confirmatory factor analysis (CFA). The results of Harman's single-factor test via exploratory factor analysis indicated a multi-factor structure. The factor with the largest eigenvalue accounted for 40.7% (out of 79.4%) of the total variance, below the threshold of 50% (Podsakoff & Organ, 1986). The CFA test examined whether a common factor accounted for all the variance in the data. The comparison results showed that the proposed measurement model fit significantly better than the common-factor model ($\Delta\chi^2 = 13623.93, \Delta df = 23, p < 0.001$). These results suggested that CMV was not a significant concern.

4.2. Measurement model test

CFA was performed to evaluate construct validity and to estimate the model fit of the measurement model before testing the proposed hypotheses through structural equation modeling (Kline, 2010). The results showed that the measurement model had good model fit indices ($\chi^2/df = 3.062, RMR = 0.022, RMSEA = 0.043, NFI = 0.953, IFI = 0.968, TLI =$

0.964, CFI = 0.968) (Kline, 2010). Reliability and validity were further checked by evaluating Cronbach's alphas, composite reliability (CR), and convergent and discriminant validities (Tables 1 and 2). The results demonstrated that the measurement model was reliable and valid, which allowed for further hypothesis testing of the structural model.

[Insert Tables 1 & 2 here]

4.3. Structural model test

Structured equation modeling (SEM) was used to test the hypothesized relationships. Table 3 and Figure 2 present the SEM results. The results indicated that the structural model was a good fit to the data ($\chi^2/df = 4.713$, RMR = 0.086, RMSEA = 0.058, NFI = 0.927, IFI = 0.942, TLI = 0.935, CFI = 0.942). The findings supported nine of the 11 hypothesized direct relationships (Table 3). No significant direct relationship was found between destination psychological ownership and TERBI ($\beta = 0.048$, $p > 0.05$) or attitudes toward the behavior ($\beta = 0.011$, $p > 0.05$), H₄, and H₅ were thus not supported.

[Insert Table 3 & Figure 2 here]

4.4. Explanatory power of model

The explanation power of the model was tested by evaluating the R² values of its major endogenous variables. The threshold for the R² values for the large, medium, and minor effects in the model are 0.25, 0.09, and 0.01, respectively (Cohen, 1988). The squared multiple correlations (SMC = R²) indicated that the model explained 15.7%, 44.8%, 32.0%, and 54.8% of the variance for perceived environmental responsibility, place attachment, attitudes, and TERBI, respectively. Benchmarking with the suggested values, this model possessed good explanatory power. The proposed model connecting destination psychological ownership to TERBI was thus robust, both theoretically and empirically. Findings showed that TPB (i.e., M₀) explained 50% of the variance for TERBI, PAB (i.e., M₁) only had 38.9%, while the conceptual model (i.e., M₂) had a higher 54.8% explanation (see Appendix C). The results demonstrated that compared with any single model, the integrated model did better in explanatory power. The results of model comparison tests in each sub-group were consistent with the hypothesized results from the total sample (see Appendix C).

4.5. Mediating effect tests

Perceived environmental responsibility, place attachment, and attitude towards the behavior were hypothesized to mediate the relationship between destination psychological ownership and TERBI partially. The bootstrapping method was used to test the significance of the proposed mediating effects because it does not impose the assumption of normality of the sampling distribution (Preacher & Hayes, 2008) and is also considered statistically robust in previous research (MacKinnon et al., 2004).

The number of bootstrap samples was set to 5,000, using 95% bias-corrected and percentile confidence intervals (hereafter, BCI and PCI). Table 4 presents the results of the bootstrapping test. According to Zhao et al. (2010), the mediation effect is significant if the confidence interval for the indirect effect does not contain zero. A significant specific indirect effect was identified for destination psychological ownership on TERBI through perceived environmental responsibility (BCI: [0.024, 0.079]; PCI: [0.024, 0.078]). Similarly, the results in Table 4 supported another three specific indirect links: DPO→PER→ATT→TERBI, DPO→PA→TERBI, and DPO→PA→ATT→TERBI. However, the DPO→ATT→TERBI path was not supported (BCI: [-0.009, 0.014]; PCI: [-0.009, 0.014]).

The effect ratio, which refers to the proportion of the total mediation effect (Kelley & Preacher, 2012), was calculated to estimate the relative magnitude of the mediation. The results demonstrated that the indirect effects of destination psychological ownership on TERBI through place attachment were stronger than those through perceived environmental responsibility and attitudes. Place attachment was found to be the most potent mediator in the link. It mediated 71.5% (DPO→PA→TERBI) of ownership's total mediating effect on TERBI.

[Insert Table 4 here]

4.6. Comparative analysis between Gen Z and older generation

A total of 1,096 valid respondents were divided into two groups: the Gen Z sub-sample ($n = 549$) and the older generations sub-sample ($n = 547$). A one-way analysis of variance (ANOVA) using the Scheffe's test was adopted to explore whether any differences existed between the age groups for TERBI (Lee et al., 2018). The average score of TERBI was 3.725 for Gen Z, whereas the corresponding value was 3.815 for older generations. The ANOVA

test suggested significant differences between Gen Z and older generations in explaining TERBI ($F = 4.544, p = 0.033$), supporting H₁₂.

In each sub-group, the measurement model's reliability and validity tests were passed (see Appendixes D and E). The results of structural model assessment (Figures 3 and 4) and specific mediation analysis in each sub-group were in line with the hypothesized results from the total sample (see Appendixes F and G).

[Insert Figures 3 & 4 here]

According to the suggestion by Su and Swanson (2017), the multi-group comparative analysis method in AMOS was introduced for a comparative analysis between Gen Z and older generations. Both groups' data were imported and six different conditions set up. Appendix H demonstrates an acceptable fit in all the tested models. Significant differences were found in testing differences between the constrained and the unconstrained models (see Appendix I), indicating that age acted as a moderator in the conceptual model.

To make sure if any hypothesized paths were different between Gen Z and older generations, the critical radical ratio of difference (CRD) of the same paths between the two sub-samples was examined. The CRD of each group is provided in Table 5. The findings showed that the direct effect of subjective norms on TERBI was significantly different ($CRD = -2.991, p < 0.05$) (Steenkamp & Baumgartner, 1995). However, significant differences in any other direct hypothesized paths between Gen Z and older generations were not supported, as the value of CRD was below the cut-off point of 1.96 with a p -value exceeding 0.05 (Table 5).

[Insert Table 5 here]

5. Discussion, conclusions, and implications

5.1. Conclusions

Understanding the antecedents of TERBI is vital to a destination's sustainability (Su et al., 2018b). Through the lens of two theoretical frameworks (TPB and PAB), an integrated model of destination psychological ownership, perceived environmental responsibility, and place attachment was developed to explain the effect of destination psychological ownership on TERBI. Data were collected in Hangzhou from two sub-samples, Gen Z and older

generations. The results (being consistent for the two samples) found that most of the proposed hypotheses were supported.

This research confirmed that all three TPB variables (perceived behavioral control, subjective norms, and attitudes toward the behavior) positively predicted TERBI. The more positive were attitudes toward environmentally responsible behavior and the more significant were the perceived behavioral control and subjective norms, the stronger were the intentions to behave in an environmentally responsible way. Various tourism studies have applied the TPB framework and explored the direct links between TPB factors and individuals' behavioral intentions (Han, 2015). These scholars found that all of the TPB factors explained behavioral intentions. Thus, TPB is a feasible theoretical framework for explaining TERBI (Loureiro et al., 2022; Zheng et al., 2022).

Destination psychological ownership did not directly impact pro-environmental behavioral intentions. This result seems to contradict the assumption that when tourists feel like the psychological hosts of the destination, they will have stronger intentions to engage in TERBI as the destination would be an extended part of the self (Wang et al., 2022). However, further analyses suggested that the impact of destination psychological ownership on TERBI was mediated by perceived environmental responsibility and place attachment.

The findings confirmed that perceived environmental responsibility was significantly and positively associated with attitudes and TERBI. The results were consistent with existing studies in different settings (Lu et al., 2021; Patwary et al., 2021). More importantly, $DPO \rightarrow PER \rightarrow TERBI$ and $DPO \rightarrow PER \rightarrow ATT \rightarrow TERBI$ sequences were supported (Table 4). This effect occurs because feelings of ownership increase perceived responsibility, which then leads to proactive intentions of environmental actions (Peck et al., 2021). Place attachment's direct and positive influence on attitudes and TERBI was identified, supporting the standpoint in past tourism studies (Qiu, 2017). $DPO \rightarrow PA \rightarrow TERBI$ and $DPO \rightarrow PA \rightarrow ATT \rightarrow TERBI$ sequences were identified (Table 4). The results confirmed the logic from Zhang and Xu's (2019) work and provide a better understanding of the mediating effect by showcasing the sequential mediating roles of place attachment and attitudes.

The magnitude and drivers of TERBI between Gen Z and older generations were evaluated. Given that each generation seems to have its profile and characteristics of

prototypical behaviors as per generation theory (Twenge et al., 2010), it is useful to know how age groups (Gen Z and older generations) can serve as a boundary condition in TERBI formation. As found in the prior literature (Parzonko et al., 2021), the results suggested that compared to Gen Z, older generations are more engaged in pro-environmental behavior. This is likely explained by the reasoning that as people grow older, they become more concerned about the environment (Franzen & Meyer, 2010) and are more likely to exhibit environmentally responsible ways during travel (Dolnicar, 2004). Therefore, the study showcased how generation groups vary in TERBI and pro-environmental decision-making processes.

5.2. Theoretical implications

Viewing tourists as the invited hosts of the destination, this research makes a pioneering effort to shed light on how destination psychological ownership contributes to TERBI, thus providing unique theoretical implications for the sustainable management of tourism destinations.

First, the application of TPB was extended by taking the PAB framework into account. The TPB is the most commonly used theoretical framework for explaining TERBI (Esfandiar et al., 2022). However, destination psychological ownership provides new insight into explaining behaviors from the viewpoint of the tourist-destination deep psychological bond, i.e., tourists as the invited hosts (Kumar & Nayak, 2019). The PAB model has been successfully applied in explaining residents' citizenship behavior for two destinations (Zhang & Xu, 2019). This research, however, supplements TPB concerning how PAB could help understand the influence of destination psychological ownership on TERBI. Applying the theoretical frameworks of TPB and PAB (Ajzen, 1991; Pierce et al., 1991), this research bridged the gap by developing an integrated model to explore the process leading from destination psychological ownership to TERBI. The results demonstrated that the integrated model had better explanatory power than either TPB or PAB. To the researchers' best knowledge, this is one of the first attempts to apply these frameworks in tandem as we move toward understanding more about which main predictors contribute to TERBI.

Second, the findings add to the current literature by examining perceived environmental responsibility and place attachment as mediators of the impact of destination psychological

ownership on TERBI. There is a need to evoke destination psychological ownership to promote the proactive uptake of TERBI. However, addressing the 'black-box' of the mediation remains somewhat vague, as little empirical evidence exists for the intervening variables in the relationship between destination psychological ownership and TERBI (Li et al., 2020). The results indicated that TERBI was indirectly influenced by destination psychological ownership through the mediation of perceived environmental responsibility and place attachment. Identifying differences among the multiple mediation paths is important to uncovering the critical mediator (Qiu et al., 2022b). Compared to the other mediator (i.e., perceived environmental responsibility), place attachment played a more vital mediating role in the link between destination psychological ownership and TERBI. This finding was in line with the prior literature that supports a critical mediating role of place attachment in explaining the process of tourist environmentally responsible behavior (Qiu et al., 2022b). In sum, destination psychological ownership helps to promote TERBI, depending on the dual-mediators of perceived environmental responsibility and place attachment. This study complemented the recent work from Li et al. (2020) and Zhang and Xu (2019) in elaborating on how destination psychological ownership motivates tourists to be more engaged in pro-environmental activities.

Third, this study takes an initial step to perform a comparative analysis of Gen Z and older generations in TERBI decision-making. No study has so far explored the differences between Gen Z and other generation groups regarding levels and predictors of TERBI. The results showed that the effect of subjective norms on TERBI was lower in the older generations than in Gen Z tourists. Compared to the older generations, Gen Z tourists were more likely to obey the expectations of significant others and take others' opinions as guidance for their behavior. This finding was consistent with the standpoint developed from Kohlberg and Kramer's (1969) theory of moral development. Gen Z tourists follow the principle of good children and take the encouragement and praise from parents and relatives as a behavioral principle. The older generations, however, are relatively more independent in normative influences and inclined to make decisions independently.

5.3. Practical implications

This study offers practical implications to destination managers in promoting sustainable tourism development, especially related to SDG 15. First, destination managers need to regard tourists as the psychological owners of the destination. The notion of tourists and tourism organizations acting as 'custodians' with co-stewardship of the places they value is crucial to sustainable tourism development. Destination managers should promote tourist understanding that they are the invited hosts of the destination, thus being a key stakeholder in protecting that destination. To strengthen ownership feelings for a destination, destination managers should provide tourists with more opportunities to engage in tourism-related decision-making. Multiple communication strategies (offline and online) should be used to enhance tourists' destination psychological ownership.

Second, perceived environmental responsibility must be highlighted due to its meaningful contribution to promoting TERBI. Pro-environmental attitudes and TERBI are driven by perceived environmental responsibility. To motivate environmentally friendly norms, destination managers should emphasize tourist responsibility for participating in environmentally responsible practices via imperceptible propaganda education about ecological civilization. Green supportive environment construction is inseparable from implementing sustainable tourism to achieve SDG 15. For example, destination managers should consider designing and organizing more frequent events with a focus on destination sustainability, which will encourage greater responsibility for pro-environmental behavior.

In addition, the nurturing of place attachment should be accentuated. Place attachment is the most critical mediator between destination psychological ownership and TERBI. For developing sustainable tourism, various strategies to activate the formation of place attachment should be adopted. For instance, popular social media platforms such as TikTok, Weibo microblogging, and WeChat are ideal platforms for shaping attractive and unique destination images to elicit place attachment. Additionally, on-site facilities and services should be improved, and unique experiences staged to create memorable tourist experiences and potential destination attachment.

Lastly, market segmentation based on different generations should be applied. To promote sustainable tourism concerning SDG 15, it is crucial to understand tourist profiles

to benefit the destination environment (Lee et al., 2018). The findings demonstrated that, compared to older generations, Gen Z is less inclined to engage in environmentally responsible behaviors when traveling. However, for Gen Z, the effect of subjective norms on TERBI is significantly higher. Therefore, destination managers should have varying strategies to target different generations to encourage proactive TERBI. Notably, the role of subjective norms should be taken more into account to promote TERBI among Gen Z for sustainable destination development.

5.4. Limitations and future research directions

This research has some limitations that can help inform directions for future research. First, this study captured self-reported intentions of pro-environmental behaviors. The reported behavioral intentions may be biased due to the social desirability effect. Future studies should assess individuals' actual behaviors in multiple ways (e.g., reports of others' behaviors or behavioral observations). Second, the results were based on cross-sectional data. However, following this design, the causality within the integrated model may not be revealed effectively. Future research is thus needed to incorporate longitudinal data to validate the causal nature of the mentioned relationships.

Third, the participant profile of this study included minors, i.e., tourists aged under 18 (5.8%) in the Gen Z sample. Considering that the propaganda education about ecological civilization has been well-executed at school, as younger teenagers, Gen Z should be able to understand and provide reasonable responses to the survey questions about travel and environmental protection that are not far away from their daily lives. However, it is admitted that a comprehension discrepancy likely existed among this small portion of participants. Thus, reliable ways to gain informed consent should be practiced in future research, along with more scientific techniques that facilitate surveys with minors.

Lastly, this research examines the positive outcomes (i.e., facilitating TERBI) of destination psychological ownership. However, destination psychological ownership might backfire, causing unexpected negative consequences (Pierce et al., 2001, 2003; Wang et al., 2022) for the destination. For example, tourists might feel psychologically entitled to do whatever they want to the destination, potentially resulting in interpersonal or intergroup conflicts with local residents. In this regard, future research needs to examine whether

destination psychological ownership has unintended adverse consequences.

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Figure

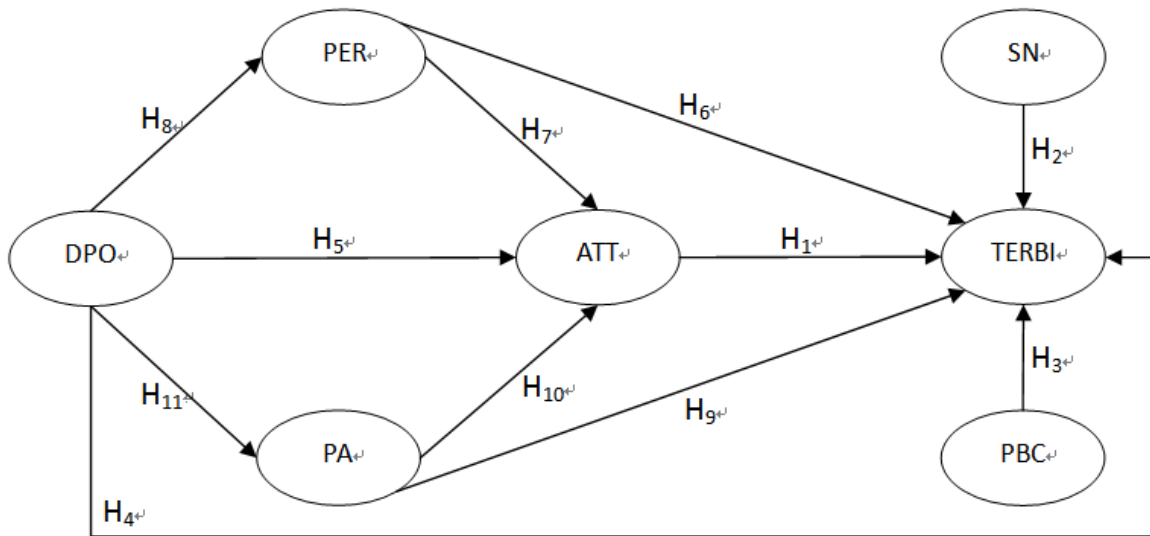


Figure 1. Conceptual model

Note: DPO=destination psychological ownership; PER=perceived environmental responsibility; PA=place attachment; ATT=attitudes toward the behavior; SN=subjective norms; PBC=Perceived behavioral control; TERBI=tourist environmentally responsible behavioral intentions.

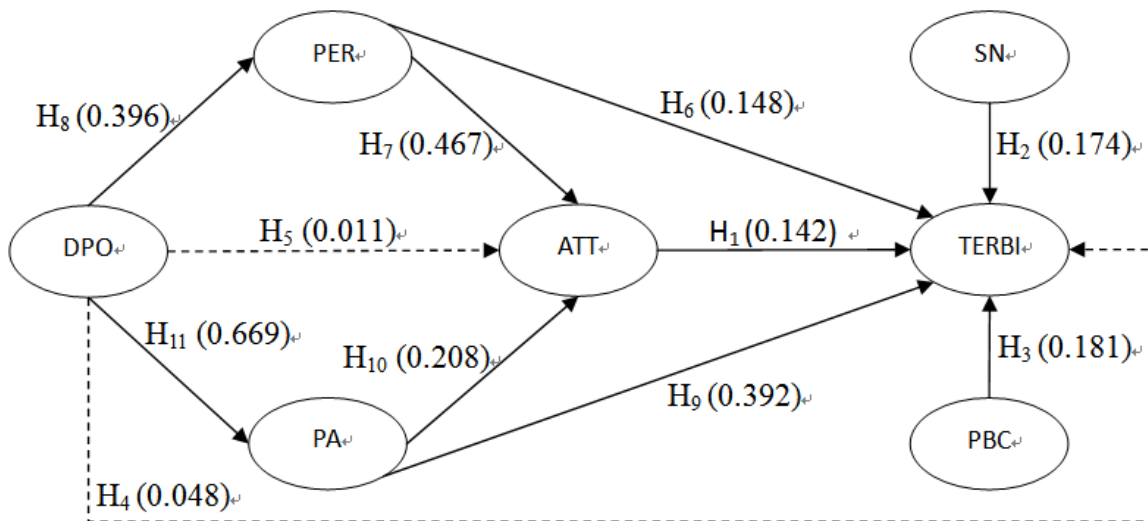


Figure 2. Results of the hypothetical model.

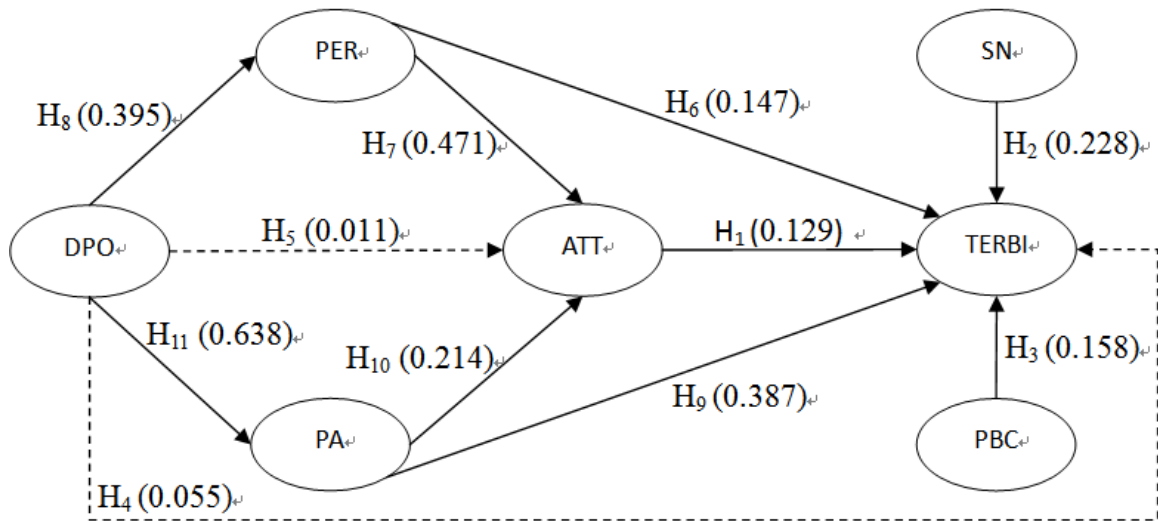


Figure 3. Results of hypothetical model (Gen Z).

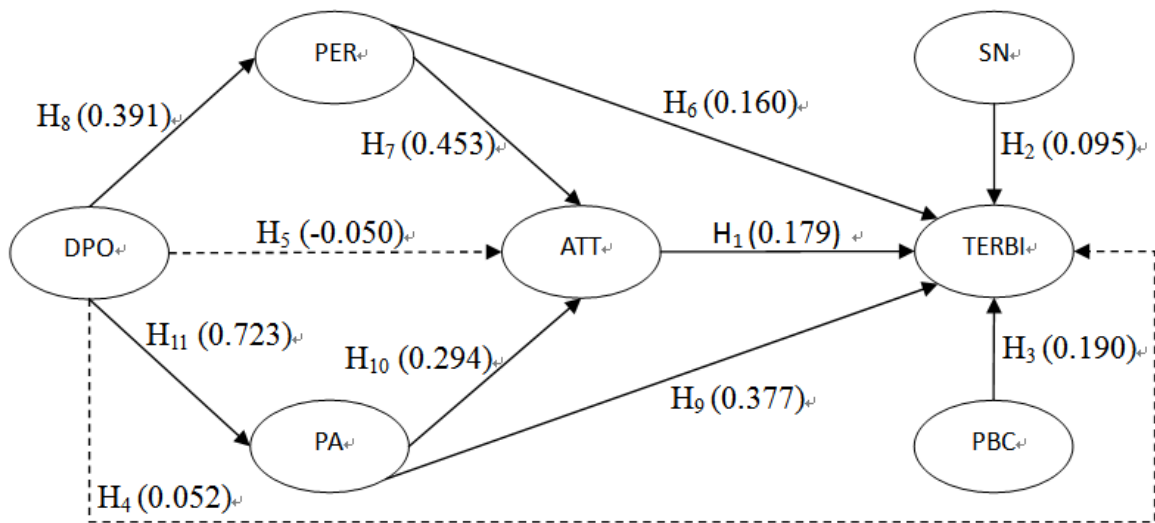


Figure 4. Results of hypothetical model (older generations).

Table

Table 1. Results of measurement model.

| Construct and item label | Std. factor loading | <i>t</i> values | CR | AVE | α |
|--|---------------------|-----------------|-------|-------|----------|
| Attitudes toward the behavior (ATT) | | | 0.933 | 0.776 | 0.931 |
| ATT1 | 0.844 | 36.189 | | | |
| ATT2 | 0.912 | 41.723 | | | |
| ATT3 | 0.907 | 41.293 | | | |
| ATT4 | 0.858 | — | | | |
| Subjective norms (SN) | | | 0.933 | 0.777 | 0.932 |
| SN1 | 0.829 | 35.904 | | | |
| SN2 | 0.915 | 43.411 | | | |
| SN3 | 0.909 | 42.909 | | | |
| SN4 | 0.87 | — | | | |
| Perceived behavioral control (PBC) | | | 0.897 | 0.684 | 0.896 |
| PBC1 | 0.818 | 31.609 | | | |
| PBC2 | 0.835 | 32.547 | | | |
| PBC3 | 0.817 | 31.56 | | | |
| PBC4 | 0.838 | — | | | |
| Destination psychological ownership (DPO) | | | 0.876 | 0.703 | 0.876 |
| DPO1 | 0.808 | 29.791 | | | |
| DPO2 | 0.873 | 32.025 | | | |
| DPO3 | 0.833 | — | | | |
| Perceived environmental responsibility (PER) | | | 0.92 | 0.699 | 0.919 |
| PER1 | 0.817 | 28.012 | | | |
| PER2 | 0.885 | 30.643 | | | |
| PER3 | 0.856 | 29.544 | | | |
| PER4 | 0.864 | 29.85 | | | |
| PER5 | 0.751 | — | | | |
| Place attachment (PA) | | | 0.818 | 0.692 | 0.931 |
| Place dependence (PD) | | | 0.930 | 0.769 | 0.929 |
| PD1 | 0.843 | 35.682 | | | |
| PD2 | 0.909 | 40.788 | | | |
| PD3 | 0.901 | 40.202 | | | |
| PD4 | 0.853 | — | | | |
| Place identity (PI) | | | 0.922 | 0.748 | 0.921 |

| | | | | | |
|---|-------|--------|-------|-------|-------|
| PI1 | 0.854 | 34.346 | | | |
| PI2 | 0.884 | 36.264 | | | |
| PI3 | 0.892 | 36.769 | | | |
| PI4 | 0.828 | — | | | |
| Tourist environmentally responsible behavioral intentions (TERBI) | | | 0.866 | 0.617 | 0.863 |
| TERBI1 | 0.764 | 25.15 | | | |
| TERBI2 | 0.822 | 27.139 | | | |
| TERBI3 | 0.795 | 26.216 | | | |
| TERBI4 | 0.759 | — | | | |

Note: CR=composite reliability; AVE=average variance extracted; α =Cronbach's alpha.

Table 2. Results of discriminant validity.

| Construct | ATT | SN | PBC | DPO | PER | PA | TERBI |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Attitudes toward the behavior (ATT) | 0.881 | | | | | | |
| Subjective norms (SN) | 0.561 | 0.881 | | | | | |
| Perceived behavioral control (PBC) | 0.329 | 0.412 | 0.827 | | | | |
| Destination psychological ownership (DPO) | 0.279 | 0.299 | 0.461 | 0.838 | | | |
| Perceived environmental responsibility (PER) | 0.549 | 0.570 | 0.485 | 0.322 | 0.836 | | |
| Place attachment (PA) | 0.425 | 0.528 | 0.688 | 0.605 | 0.477 | 0.832 | |
| Tourist environmentally responsible behavioral intentions (TERBI) | 0.513 | 0.563 | 0.582 | 0.486 | 0.548 | 0.713 | 0.785 |

Note: Diagonally positioned values in bold denotes the square roots of AVEs.

Table 3. Results of structural model.

| Hypotheses | paths | Standardized coefficient | SE | <i>t</i> -value | <i>p</i> -value | Results |
|-----------------|-----------|--------------------------|-------|-----------------|-----------------|---------------|
| H ₁ | ATT→TERBI | 0.142 | 0.029 | 4.366 | *** | Supported |
| H ₂ | SN→TERBI | 0.174 | 0.024 | 5.914 | *** | Supported |
| H ₃ | PBC→TERBI | 0.181 | 0.026 | 5.355 | *** | Supported |
| H ₄ | DPO→TERBI | 0.048 | 0.041 | 0.983 | 0.326 | Not supported |
| H ₅ | DPO→ATT | 0.011 | 0.045 | 0.241 | 0.81 | Not supported |
| H ₆ | PER→TERBI | 0.148 | 0.034 | 4.447 | *** | Supported |
| H ₇ | PER→ATT | 0.467 | 0.04 | 13.719 | *** | Supported |
| H ₈ | DPO→PER | 0.396 | 0.028 | 11.626 | *** | Supported |
| H ₉ | PA→TERBI | 0.392 | 0.043 | 8.233 | *** | Supported |
| H ₁₀ | PA→ATT | 0.208 | 0.047 | 4.487 | *** | Supported |
| H ₁₁ | DPO→PA | 0.669 | 0.037 | 17.191 | *** | Supported |

Note: **p* < 0.05, ***p* < 0.01, ****p* < 0.001.

Table 4. Specific mediation test results via bootstrapping method.

| Specific indirect path | Point estimate | Product of coefficients | | Bootstrap | | | | Support? |
|------------------------|----------------|-------------------------|-------|-----------|-------|--------|-------|----------|
| | | SE | Z | PCI | | BCI | | |
| | | | | Lower | Upper | Lower | Upper | |
| DPO→PER→TERBI | 0.05 | 0.014 | 3.571 | 0.024 | 0.078 | 0.024 | 0.079 | Yes |
| DPO→PER→ATT→TERBI | 0.022 | 0.006 | 3.667 | 0.011 | 0.035 | 0.011 | 0.036 | Yes |
| DPO→ATT→TERBI | 0.001 | 0.006 | 0.167 | -0.009 | 0.014 | -0.009 | 0.014 | No |
| DPO→PA→TERBI | 0.223 | 0.035 | 6.371 | 0.158 | 0.295 | 0.159 | 0.296 | Yes |
| DPO→PA→ATT→TERBI | 0.017 | 0.006 | 2.833 | 0.007 | 0.029 | 0.008 | 0.031 | Yes |

Note: BCI=Bias-corrected 95% confidence intervals, PCI=Percentile 95% confidence interval.

Table 5. Path coefficient comparisons between Gen Z and older generations.

| Hypothesized path between two sub-samples | Critical radical ratio of difference (CRD) |
|---|--|
| ATT→TERBI | 0.08 |
| SN→TERBI | -2.991* |
| PBC→TERBI | 0.059 |
| DPO→TERBI | -0.167 |
| DPO→ATT | -0.641 |
| PER→TERBI | -0.582 |
| PER→ATT | -0.603 |
| DPO→PER | 0.481 |
| PA→TERBI | -0.612 |
| PA→ATT | 1.193 |
| DPO→PA | 0.109 |

Note: * $p < 0.05$.