

The impact of green hotel practices on customer in-role and extra-role behaviors: a cross-cultural perspective

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Abstract

Purpose – Drawing on social exchange and value co-creation theories, this study aims to investigate how green hotel practices shape customers' in-role (revisit intentions) and extra-role (green customer citizenship behavior) behaviors through customers' perceived green benefits and costs. The moderating role of customers' green knowledge and cultural differences are also explored.

Design/methodology/approach – Two studies were conducted using online surveys with a Chinese and a US sample. Partial least squares structural equation modeling was used to test the hypotheses in each study, followed by multigroup analysis to examine the two samples' cultural differences.

Findings – Across both cultures, green hotel practices directly influence customers' green citizenship behavior. Serial mediation pathways reveal that green practices influence revisit intention through perceived benefits/costs, followed by citizenship behaviors. Customer green knowledge consistently moderates the cost-reduction effects. Cross-cultural analysis reveals that Chinese customers respond more to green practices in value perceptions, while US customers experience more conversion from citizenship behaviors to loyalty intentions.

Practical implications – The findings provide actionable insights for managers to cultivate loyalty, primarily by structuring more opportunities for customer citizenship behavior – a critical bridge to revisit intention. It requires strategically enhancing benefits while mitigating perceived costs, and maximizing impact by tailoring communication to different cultural contexts.

Originality/value – This study offers a comprehensive analysis of green hotel practices by examining perceived value through perceived benefits and costs, and provides validation that cultural orientations shape customer responses to green initiatives.

Keywords Green hotel practices, Citizenship behavior, Perceived benefits, Perceived cost, Green knowledge, Social exchange theory

Paper type Research paper

Introduction

Interest in green hospitality has been increasing since the 1990s, with hotels adopting green practices in daily operations (Sharma *et al.*, 2024). For instance, China's largest online booking platform, Ctrip.com, has partnered with prominent hotel groups to introduce low-carbon certifications, requiring hotels to implement various green practices, such as prioritizing local and organic food procurement, using energy-efficient systems and limiting single-use toiletries. These

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practices aim to reduce the hotel's environmental impact, and meet the demands of environmentally conscious stakeholders, especially customers (Majeed *et al.*, 2023). This transformation has positioned hotels as both environmental consumers and producers that generate green value. Consequently, customers have increasingly embraced pro-environmental behaviors (Trang *et al.*, 2019) and a preference for eco-friendly accommodation (Raza and Farukh, 2023). This trend has sparked a surge of research in green hospitality, particularly customer perceptions and behaviors in response to green initiatives.

Prior studies have found that when hotels implement green practices, customers develop corresponding value perceptions (Abdou *et al.*, 2022). This reaction aligns with social exchange theory (SET), in which value serves as a key mechanism connecting hotel service offerings to customer consumption. This relationship is influenced by the benefits customers receive versus the costs incurred. Notably, while early scholars (e.g. Jiang and Kim, 2015) advocated for further decomposing the value dimension, most recent research considers perceived green value a unidimensional construct. Moreover, existing studies tend to focus more on benefits than perceived costs (e.g. Dang-Van *et al.*, 2024). Only a few scholars, such as Ahn and Kwon (2020), have examined the differentiation between benefits and costs when assessing the influences of green hotel practices on customer value perceptions. This omission may oversimplify complex customer value perceptions of green hospitality.

Furthermore, existing research has predominantly examined how green practices influence customer in-role behaviors, which refer to expected behaviors directly related to service consumption, such as revisit intentions (e.g. Ahn and Kwon, 2020). In contrast, extra-role behaviors are voluntary, nonremunerated contributions that create added value for the firm (Van Tonder *et al.*, 2023). While recent studies (e.g. Tran *et al.*, 2025) have explored the effect of green hotel practices on customer citizenship behavior, research on extra-role behavior remains relatively limited. Notably, scholars have called for research that simultaneously investigates in-role and extra-role customer behaviors in response to green hotel practices (Wang *et al.*, 2024), understanding that customer behaviors often interconnect and influence one another. For example, by adding the perspective of value co-creation theory (VCT), customer citizenship behaviors become a key dimension of value co-creation (Gong and Yi, 2021), potentially enhancing the overall exchange value and encouraging in-role behavior (Mandl and Hogreve, 2020). However, these relationships require empirical validation within specific contexts.

Building on the integrated theoretical foundation of SET and VCT, this study aims to address these gaps by investigating the relationships among green hotel practices, customer perceptions of green benefits and costs, customer behaviors (green customer citizenship behavior and revisit intention). We examine how green hotel practices impact customer in- and extra-role behaviors, and whether these effects are mediated by perceived green benefits and costs. We further extend this model by testing the moderating role of customer green knowledge and conducting a cross-cultural comparison (China vs USA) to reveal how cognitive and cultural factors shape the proposed relationships. This study contributes an integrated framework that demonstrates how green hotel practices foster customer loyalty through dual value pathways and sequential citizenship behavior, and identifies the cognitive and cultural conditions under which these effects are amplified or weakened.

Literature review

Theoretical foundation: social exchange theory and value co-creation theory

SET, the primary theoretical lens for this study, posits that social behaviors result from a value-based exchange process (Cropanzano and Mitchell, 2005). In the hotel industry, customers engage in exchange relationships in which green practices reshape the traditional

service dynamic by integrating environmental attributes into offerings (Trang *et al.*, 2019). This transformation alters customers' perceived value (Jiang and Kim, 2015), subsequently influencing their behaviors according to SET's reciprocity principle (Cropanzano *et al.*, 2017).

However, in green hospitality, critical extensions of SET remain underexplored. First, value perceptions are heterogeneous, encompassing distinct benefit and cost components that differentially influence customer decision-making (Jiang and Kim, 2015). These perceptions are further shaped by individual cognitive (e.g. customer green knowledge) and cultural factors (Ahmad *et al.*, 2023). Research on how these factors shape customer evaluations of, and responses to, green hotel practices is limited. Furthermore, by integrating environmentally friendly attributes into their offerings (Trang *et al.*, 2019), green hotels create a context (Mishra and Gupta, 2019) in which customers' roles can evolve beyond passive recipients to active participants (Tran *et al.*, 2025). While SET explains reciprocal behaviors based on received benefits, it may not fully capture how customers' engagement and voluntary contributions shape their own perceived value and subsequent behavioral intentions (Esawe *et al.*, 2024).

VCT complements SET by emphasizing customers as value co-creators (Carvalho and Alves, 2023). From this perspective, customers' extra-role citizenship behaviors are not merely reciprocal actions within an SET framework, but also contributions to the co-creation of sustainable service experiences. Consequently, customers become value co-producers, which can enhance their perception of the exchange (Tran and Vu, 2021) and, in turn, reinforce in-role behaviors, such as revisit intention (Gong and Yi, 2021). This integrated framework thus provides a more comprehensive lens through which to understand the interplay between hotel initiatives and multifaceted customer responses.

Green hotel practices

In recent years, the hotel industry's green transformation has attracted significant scholarly attention, with research exploring various dimensions, such as green attributes (Trang *et al.*, 2019), green service-scapes (Mishra and Gupta, 2019) and green practices (Wang *et al.*, 2024). These concepts collectively highlight the efforts that hotels make to demonstrate their environmental responsibilities and sustainability. Green practices refer to actions, strategies and initiatives that hotels adopt to reduce their environmental impact and promote sustainability (Wang *et al.*, 2024). Motivated by factors ranging from economic incentives (Arbelo *et al.*, 2025) to consumer demand (Tran *et al.*, 2025), the extent and nature of green practices may vary among hotels, encompassing both front-of-house actions that are visible to guests and less visible back-of-house practices (Chia-Jung and Pei-Chun, 2014). While back-of-house efforts focus on operational efficiency (Preziosi *et al.*, 2019), front-of-house initiatives, such as recycling and energy-efficient amenities, directly shape guest perceptions (Wang *et al.*, 2024). Given that our research focuses on consumer responses to green hotel practices, we prioritized front-of-house practices as they more directly affect how guests evaluate a hotel's sustainability efforts.

Customer in-role and extra-role behaviors in hotels

Customers are pivotal actors in hotels' green value chains; their choices, such as selecting eco-friendly accommodations or joining sustainability programs, shape the success of hotels' green initiatives (Luu, 2022). Within the framework of organizational behavior, customer behaviors can be categorized as in-role and extra-role (Paulssen *et al.*, 2019). In-role behaviors are formally required and expected, representing the baseline actions necessary to fulfill one's role, such as willingness to pay premium (Wei *et al.*, 2024) and intention to

revisit (Dang-Van *et al.*, 2024). Existing studies on them far outnumber those on extra-role behavior, which are voluntary, non-remunerated, discretionary contributions that create added value for the firm (Van Tonder *et al.*, 2023). Nevertheless, investigating extra-role behaviors is crucial as they represent a higher level of customer engagement (Mansoor *et al.*, 2025), which can amplify the positive impact of hotels' green initiatives (Tran *et al.*, 2025). Furthermore, a few prior studies (Wang *et al.*, 2024) emphasize that jointly examining in-role and extra-role behaviors enables a more comprehensive understanding of how green attributes influence the spectrum of customer responses; however, integrative empirical models simultaneously incorporating both remain scarce.

Accordingly, this study examines two key green customer behaviors: revisit intention as an in-role behavior and green customer citizenship behavior as an extra-role behavior. Revisit intention reflects the likelihood of customers returning to green hotels (Kim *et al.*, 2017) and constitutes a fundamental expected behavioral response. Green customer citizenship behavior refers to voluntary actions that exceed basic service expectations yet substantially support the implementation and enhancement of a hotel's environmental initiatives and green practices (Van Tonder *et al.*, 2020). By simultaneously investigating both in-role and extra-role behaviors, we can gain a more holistic understanding of the complex influence of green hotel practices on customer behaviors (Majeed *et al.*, 2023).

Perceived green values: benefits and costs

Perceived value is traditionally defined as a consumer's assessment of the utility of a product or service based on what is received versus given, and in green consumption this concept is extended to incorporate environmental considerations alongside conventional evaluative criteria before, during and after consumption (Wang *et al.*, 2024). Conceptually it is a benefit–cost tradeoff (Jiang and Kim, 2015), yielding two salient subdimensions. Perceived green benefits refer to the positive outcomes or advantages that consumers believe they will gain from a product or service in green hotels, such as healthier environments, value congruence, social recognition and an enhanced sense of well-being (Merli *et al.*, 2019; Yu *et al.*, 2024). Conversely, perceived green costs encompass the negative aspects or sacrifices that consumers must endure to acquire or use a product or service (Ahn and Kwon, 2020), such as monetary sacrifice, inconvenience (e.g. reduced comfort from certain eco-friendly amenities) and adaptation effort linked to sustainable practices (Jiang and Kim, 2015).

Despite this dual structure, most studies operationalize perceived green value as a unidimensional construct (e.g. Roh *et al.*, 2022; Wang *et al.*, 2024), which risks hampering precise attribution (Cropanzano *et al.*, 2017). Thus, when positive effects of green hotel practices on perceived value are reported, whether they arise from enhanced benefits, reduced costs, or a more complex interplay between these factors is unclear. Therefore, several green studies have attempted to disaggregate these dimensions (e.g. Jiang and Kim, 2015; Yang *et al.*, 2024). Our study builds on this differentiation to clarify the pathways through which green hotel practices shape customer responses.

Customers' green knowledge

Customer green knowledge refers to personal cognitive factors encompassing the awareness, understanding and information that consumers perceive they possess regarding environmental issues and eco-friendly practices (Foroughi *et al.*, 2022). Such knowledge has been found to positively influence one's environmental attitudes and green purchasing behaviors (Raza and Khan, 2022). However, it is important to note that knowledge has more than a direct influence on individual behavior. It shapes human understanding and perception of the external world, providing a foundation for interpreting and evaluating external

information (Sharifpour *et al.*, 2014). Nevertheless, few studies have explored these roles, particularly in the moderating mechanisms of individual knowledge on green purchasing behavior (Tavitiyaman *et al.*, 2024). Thus, a significant gap exists in understanding how personal knowledge influences perceptions and value judgments regarding environmentally friendly offerings.

Hypotheses development

Green hotel practices and customer in-role and extra-role green behaviors

Based on SET, the implementation of green practices can enhance the quality of customers' hotel experiences (Merli *et al.*, 2019). These experiences reinforce the social exchange process, fostering a cycle of positive reciprocity between the hotel and its guests. As a positive link between green hotel practices and loyalty has been established in several studies (e.g. Preziosi *et al.*, 2019), these positive experiences and perceptions may increase the likelihood of customers revisiting a hotel. Furthermore, when customers recognize the additional value imbued by a hotel's green practices, they may feel compelled to reciprocate by engaging in positive, voluntary behaviors that benefit the hotel (Tran *et al.*, 2025). These reciprocal actions manifest as citizenship behaviors that support the hotel's environmental efforts. Based on this reasoning, we propose the following hypotheses:

- H1. Green hotel practices positively influence customer revisit intention.
- H2. Green hotel practices positively influence green customer citizenship behavior.

Perceived green benefits and costs as mediators

Under SET, perceived green benefits and costs are seen as outcomes of the exchange process between customers and green hotels (Jiang and Kim, 2015). Hotels' green practices modify the nature of the service exchange, enriching it with environmentally friendly attributes that enhance perceived benefits. These benefits may include functional aspects, such as energy conservation, emotional satisfaction from contributing to environmental protection and social recognition from choosing eco-friendly accommodations (Tran *et al.*, 2025). Therefore, we propose:

- H3. Green hotel practices positively influence customer perceived green benefits.

The relationship between perceived green hotel practices and customer perceived costs is complex. Studies have found that green practices positively influence perceived value (Wang *et al.*, 2024). However, as perceived value is shaped by both perceived benefits and costs, its impact on perceived costs can vary. Some green initiatives may cause service reductions or inconvenience, leading customers to perceive higher costs (Gössling *et al.*, 2019). However, Park *et al.* (2024) stated that hotel managers recognize the importance of balancing green practices and guest convenience. This research suggests that in real-world situations, green practices perceived and experienced by consumers are often designed to minimize their perceived costs. Furthermore, guests who value sustainability may perceive lower psychological costs when staying in eco-friendly hotels (Jiang and Kim, 2015). Given these conflicting perspectives, the impact of green hotel practices on perceived costs remains inconclusive, leading to the following nondirectional hypothesis:

- H4. Green hotel practices influence customer perceived green costs.

The preceding arguments demonstrate the potential influence of green hotel practices on customer perceived value. According to SET, this influence motivates customers to reciprocate through increased in-role behaviors, such as revisiting the hotel, and extra-role behaviors, such as engaging in positive word-of-mouth and supporting the hotel's green initiatives (Abdou *et al.*, 2022). Therefore, the following hypotheses are proposed:

- H5. Perceived green benefits mediate the effect of green hotel practices on (a) green customer citizenship behavior and (b) revisit intentions.
- H6. Perceived green costs mediate the effect of green hotel practices on (a) green customer citizenship behavior and (b) revisit intentions.

Green customer citizenship behavior and revisit intention

Under SET, when customers perceive hotel green practices positively, they will more likely engage in citizenship behaviors (Wang *et al.*, 2024) that support hotels and amplify these initiatives. Complementing this perspective, VCT suggests that such behaviors can be viewed as value co-creation between customers and hotels (Yi and Gong, 2013), perhaps leading to further enhancement of customer value (Carvalho and Alves, 2023; Tran and Vu, 2021) and potentially triggering a continuing exchange relationship cycle (Tran *et al.*, 2025). Such engagement can reinforce customers' commitment to the hotel's sustainability efforts and create a sense of satisfaction in contributing to value co-creation (Yen, 2023). This satisfaction can lead to increased purchase intentions (Mandl and Hogreve, 2020). Hence, we propose the following hypotheses:

- H7. Green customer citizenship behavior positively influences customer revisit intention.
- H8. Perceived green benefits and green customer citizenship behavior serially mediate the influence of green practices of hotels on customer revisit intention.
- H9. Perceived green costs and green customer citizenship behavior serially mediate the influence of green practices of hotels on customer revisit intention.

Customer green knowledge as a moderator

Previous research has shown that customer knowledge affects perceived product value, especially in green hotels (Tan, 2023). While few studies have directly examined how environmental knowledge influences perceptions of green services, others suggest that rationality plays a key role in SET (Cropanzano and Mitchell, 2005), which implies the importance of cognitive resources in shaping value perceptions and influencing customers' judgment of green practices. Consumers with more green knowledge are better equipped to comprehend a hotel's green practices and recognize the potential environmental consequences (Tan, 2023). These knowledgeable consumers may be more accepting of inconveniences or additional costs related to green practices, viewing them as necessary tradeoffs for environmental preservation (Jiang and Kim, 2015). This finding suggests that environmental knowledge may negatively moderate the relationship between green hotel practices and customer-perceived green costs.

However, the literature also suggests potential drawbacks of extensive knowledge, such as overconfidence (Kang and Kim, 2022). For instance, green practices' efficacy in driving customer outcomes may depend on customers' assessment of such practices and the related

service personnel (Gao and Mattila, 2014). Customers with higher green knowledge are more likely to have well-developed schemas pertaining to corporate green practices (Tan, 2023). This knowledge may result in more critical evaluations of the hotel's green initiatives, potentially reducing the positive indirect effects on revisit intention through perceived value and green customer citizenship behavior. Therefore, we propose the following:

- 4090
- H10.* Customer green knowledge negatively moderates the relationships between green hotel practices and (a) perceived green benefits and (b) perceived green costs, such that these effects are weaker among customers with high green knowledge than among those with low green knowledge.

Customer cultural background as a moderator

SET suggests that interactions are driven by cost-benefit analyses and reciprocity norms, but these are influenced by cultural differences, particularly the individualism-collectivism (I-C) dimension (Ahmad et al., 2023). Individualist cultures, such as the USA focus on personal goals and self-reliance, while collectivist cultures (e.g. China) emphasize group goals and harmony (Han et al., 2017). Research shows that I-C shapes environmental attitudes and behaviors, with collectivists more likely to perceive green benefits and engage in environmentally friendly actions due to their focus on collective well-being (Nosrati et al., 2023). Therefore, the following hypothesis is proposed:

- H11.* Customer cultural background moderates the relationship among green hotel practices, perceived green benefits/costs and customer in-role/extra-role behaviors.

Figure 1 illustrates the research model.

Methodology

Measurement of constructs

This study used surveys in China (Study 1) and the USA (Study 2) to test the hypotheses. Green hotel practices were measured with a ten-item scale from Merli et al. (2019), with one item revised to "This hotel uses recycled materials" to better reflect current sustainability practices. Perceived green benefits and costs were adapted from Jiang and Kim (2015), green customer citizenship behavior from Yi and Gong (2013), revisit intention from Sharipudin et al. (2023) and green knowledge from Foroughi et al. (2022). All items were assessed using a seven-point Likert scale (ranging from 1 = *strongly disagree* to 7 = *strongly agree*). The English scales were translated into Chinese using a back-translation protocol to ensure accuracy.

Data collection and sample characteristics

Ethical approval for this study was obtained from the authors' institution prior to data collection. Data were collected through a self-administered online survey. For the Chinese sample, data were collected in August 2024 from Credamo, one of the most reliable and widely used data collection platforms in China. Data for the US sample were obtained in April 2025 through Qualtrics, a leading global online questionnaire firm. The survey began with an informed consent page explaining the study's purpose, assuring anonymity and stating that responses would be used only for research with no associated risks. Participants confirmed their understanding and voluntary agreement by clicking a confirmation button before proceeding.

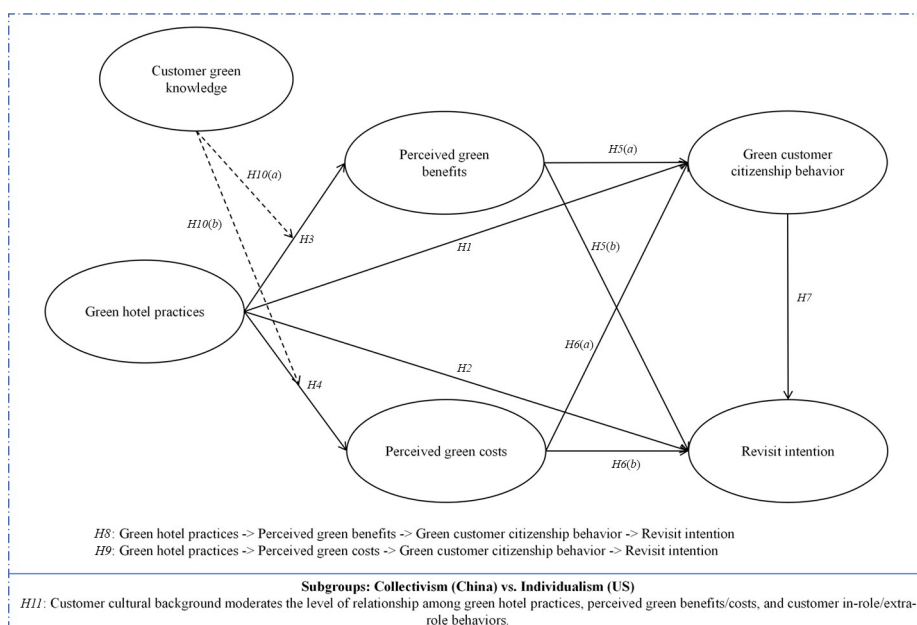


Figure 1. Proposed research model

Source: Developed by authors

Respondents were asked if they had stayed at an eco-friendly or low-carbon hotel in the past six months via an online booking platform and were required to provide verification. Only verified responses were included. Additional quality controls were implemented, including a 90% minimum submission and approval rate on both platforms, exclusion of responses with abnormal completion times and removal of repetitive or careless answer patterns. Finally, 856 valid responses were retained (550 from China, 306 from the USA). In the Chinese sample ($n = 550$), 61.2% were female, and most were aged 18–40 years (91%) with 71.2% holding a bachelor's degree. In the US sample ($n = 306$), 52.0% were female, with 63.4% aged 18–40 years and 60.8% having some college education or an associate degree.

Data analysis

This study used partial least squares structural equation modeling (PLS-SEM) to analyze the data. Preliminary analysis were conducted (see Table 1 under Supplementary materials). A two-step approach was used to evaluate the measurement model. Harman's single-factor test indicated that common method bias was not a concern. In addition, the variance inflation factors of all indicators were below the recommended cutoff value of 5 (Hair *et al.*, 2022), indicating that collinearity was not evident.

Results

Measurement model assessment and invariance test

First, we assessed the reliability and validity of the measurement models for both studies. In Study 2, two green hotel practice items showed factor loadings below 0.60 (Hair *et al.*, 2022)

and were removed from both studies to ensure configural invariance for multigroup analysis (Cheah *et al.*, 2020). Then, the measurement invariance of composite models (MICOM) was preliminarily assessed for the combined data of the Chinese and US groups (see Table 3 under Supplementary materials). The results revealed nonsignificant permutation *p*-values for all constructs, with the exception of “perceived green costs.” Therefore, following the guidelines of Cheah *et al.* (2020), one problematic item within this construct, exhibiting a significant difference in outer loadings, was identified and removed. As all constructs were reflective, removing these three items was acceptable (Nguyen, 2020).

As shown in Table 1, all remaining items in both studies exhibited factor loadings higher than 0.60 (Hair *et al.*, 2022). Both Cronbach’s alpha and composite reliability values exceeded 0.70, indicating strong internal consistency (Kline, 2005). Convergent validity was established with AVE values surpassing the recommended threshold of 0.50 (Hair *et al.*, 2022).

The discriminant validity of the scales was assessed using the Heterotrait-Monotrait Ratios (HTMT) and Fornell–Larcker criterion (Hair *et al.*, 2022). Each construct’s HTMT value was below 0.90 and the square root of the AVE of each construct was greater than its highest correlation with any other latent variable (see Table 2 under supplementary materials). Therefore, discriminant validity was achieved. Subsequently, MICOM was re-assessed see Table 3 under Supplementary materials shows non-significant permutation *p*-values for all six constructs. Thus, the data was appropriate for multigroup analysis.

Results of study 1 (Chinese sample)

Hypotheses testing. A bootstrapping technique with 10,000 bootstrap samples was used to test the hypotheses. The results (see Table 2) indicated that all proposed direct and mediating hypotheses, except *H1*, were supported. Specifically, green hotel practices were found to have a marginally nonsignificant influence on revisit intention ($\beta = 0.089$, $p = 0.051$), thus *H1* was not supported. In contrast, they demonstrated a significant positive influence on green customer citizenship behavior ($\beta = 0.320$, $p < 0.001$), supporting *H2*. Furthermore, they positively influenced perceived green benefits ($\beta = 0.440$, $p < 0.001$) and negatively influenced perceived green costs ($\beta = -0.562$, $p < 0.001$), thereby lending support to *H3* and *H4*, respectively. Additionally, green customer citizenship behavior was found to positively influence revisit intention ($\beta = 0.259$, $p < 0.001$), supporting *H7*.

The predictive power of the model was evaluated using the coefficient of determination (R^2). R^2 values of perceived green benefits, perceived green cost, citizenship behavior and revisit intention were 0.585, 0.408, 0.484 and 0.510, respectively, exceeding the cutoff value of 0.20 (Henseler *et al.*, 2009).

Mediating effects. Bootstrapping with 10,000 subsamples was used to assess the mediation effect (Hair *et al.*, 2022). The indirect effects of green hotel practices on green customer citizenship behavior via perceived green benefits (*H5a*: 95% CI [0.102, 0.193]) and costs (*H6a*: 95% CI [0.046, 0.117]) were significant, indicating *partial mediation* as direct effects were also significant. For revisit intention, perceived green benefits (*H5b*: 95% CI [0.100, 0.177]) and costs (*H6b*: 95% CI [0.070, 0.154]) *fully mediated* the relationship, as direct effects were nonsignificant. Additionally, green hotel practices influenced revisit intention through serial mediation paths involving perceived benefits and costs, then green customer citizenship behavior, with significant indirect effects of 95% CI [0.021, 0.058] (*H8*) and [0.010, 0.034] (*H9*), respectively.

Moderating effects. The moderating effect of customer green knowledge was computed using the product indicator approach (Hair *et al.*, 2022). Green hotel practices were multiplied by customer green knowledge (the moderator) to create an interaction construct.

These tests were conducted by estimating the effects of green hotel practices, the direct influence of the moderating variable and the impact of interaction variables, all on perceived green benefits and costs. The interaction effects were examined using bootstrapping with 10,000 resamples. The results indicate that customer green knowledge moderates the relationship between green hotel practices and perceived green benefits ($\beta = -0.126$, $p < 0.001$), supporting *H10a*. It also moderates the relationship between green hotel practices and perceived green cost ($\beta = -0.151$, $p < 0.001$), supporting *H10b*.

Results of Study 2 (the US sample)

Following the same analysis procedure as in Study 1, a structural model was assessed using the US sample. The results from the US sample largely mirrored those from Study 1 (Table 2), with one key difference in the moderation effects. Specifically, the direct effect of green hotel practices on revisit intention was again nonsignificant ($\beta = 0.008$, $p = 0.456$; *H1* not supported), while their positive impacts on green customer citizenship behavior ($\beta = 0.220$, $p < 0.001$; *H2*), perceived green benefits ($\beta = 0.290$, $p < 0.001$; *H3*) and their negative impact on perceived green costs ($\beta = -0.319$, $p < 0.001$; *H4*) were all significant. Green customer citizenship behavior, in turn, remained a strong positive predictor of revisit intention ($\beta = 0.433$, $p < 0.001$; *H7*).

The mediation analysis revealed identical patterns to Study 1: both perceived green benefits and costs served as significant mediators for citizenship behavior (*H5a*, *H6a*) and revisit intention (*H5b*, *H6b*), and both serial mediation paths were supported (*H8*, *H9*). The primary divergence occurred in the moderation analysis: while customer green knowledge still moderated the effect on perceived costs ($\beta = -0.121$, $p = 0.042$; *H10b* supported), its moderating role on the effect on perceived benefits was non-significant ($\beta = 0.007$, $p = 0.421$; *H10a* not supported), a notable contrast to the Chinese sample.

Multigroup analysis. The analysis identified significant differences between the Chinese and US samples across five paths (see Table 4 under supplementary materials). The positive effect of green hotel practices on perceived green benefits and the negative effect on perceived green costs were both stronger in the Chinese sample. Additionally, the indirect effect on revisit intention via perceived green benefits was greater for China. Conversely, the link between green customer citizenship behavior and revisit intention was stronger in the USA. The moderating effect of customer green knowledge on green hotel practices and perceived green benefits was negative in China but negligible in the US no significant differences were found for the other hypothesized paths.

Discussion and implications

Conclusions

Unlike prior research that has predominantly focused on unidimensional value constructs or isolated behavioral responses, our study demonstrates how the duality of green benefits and costs shapes both in- and extra-role behaviors moderated by customer green knowledge. Our model was validated across two studies in China and the USA, confirming the proposed relationships and revealing cultural variations in customer responses to green hotel practices.

First, both studies reveal that the direct effects of green hotel practices on customer behaviors differ by outcome type. In contrast to previous findings (e.g. Kim *et al.*, 2017), we found that they do not significantly influence revisit intention directly, but significantly influence green customer citizenship behavior across both cultural contexts. This pattern suggests that green practices resonate more deeply as catalysts for voluntary environmentally supportive actions (Wang *et al.*, 2024), rather than as direct drivers of transactional loyalty. The stronger effect on citizenship behavior compared to revisit intention indicates that

customers view green initiatives as opportunities for collaborative environmental stewardship rather than mere service enhancements. This finding supports the integration of VCT with SET, demonstrating SET's homeomorphic reciprocity principle (Cropanzano *et al.*, 2017), which posits that individuals tend to reciprocate based on the value and nature of what they receive. Green hotels, viewed as sharing customers' environmental values, inspire extra-role behaviors that support their green initiatives and allow customers to demonstrate their commitment to sustainability beyond financial transactions (Tran *et al.*, 2025).

Second, the mediating roles of perceived green benefits and costs clarify the psychological mechanisms underlying these relationships. Across both cultures, green practices increased perceived green benefits and reduced perceived green costs; both constructs significantly mediated the effects of green practices on green customer citizenship behavior and revisit intention (H5a–H6b). These insights reinforce the notion that customer behavior is driven by a value exchange process, as posited by SET; when customers recognize the positive outcomes of green practices, they are more likely to reciprocate with positive behaviors (Abdou *et al.*, 2022). Furthermore, the effect sizes exhibit an asymmetry: green practices have a stronger direct effect on reducing perceived green costs than on increasing perceived green benefits, yet the mediating effect via such benefits is stronger than the corresponding effect via such costs. These findings extend SET by separating the cost and benefit pathways and support decomposing green value into benefits and costs (Jiang and Kim, 2015) for a more precise explanation of green hotel customer responses.

Third, our findings reveal a complex chain of relationships linking green practices to revisit intentions through serial mediation pathways involving perceived benefits/costs and green customer citizenship behavior. This pattern, consistent across both studies, demonstrates how SET and VCT complement each other in explaining customer responses to green initiatives. Under SET, green practices shape customers' perceived green benefits and costs; when customers perceive net green value from green practices, they are motivated to reciprocate through prosocial acts that align with SET's norm of reciprocity (Cropanzano and Mitchell, 2005). Complementing SET, VCT suggests that citizenship behaviors represent active customer participation in value co-creation (Yi and Gong, 2013), which, in turn, enhances their revisit intention by amplifying their value perception (Tran and Vu, 2021) and strengthening relational commitments toward the hotels (Mandl and Hogreve, 2020).

Fourth, the moderating effects of customer green knowledge reveal both universal patterns and important cultural nuances. Across both cultures, green knowledge consistently mitigates the relationship between green practices and perceived green costs. This pattern suggests that knowledgeable customers across cultures are less influenced by cost-related concerns when evaluating green practices, possibly because their environmental expertise enables them to better understand the necessity of sustainable practices, thereby reducing sensitivity to inconveniences. This reflects customer rationality in social exchanges (Ahmad *et al.*, 2023), echoing Yoon and Chen (2017)'s finding that consumers with substantial environmental knowledge can achieve a greater understanding of hotels' green efforts.

However, significant cultural differences emerge in how green knowledge moderates the relationship between green practices and perceived green benefits. In the Chinese sample, higher knowledge weakens the positive effect of green practices on perceived benefits. Conversely, this moderation is not significant in the US sample. This cultural difference is statistically significant and suggests that Chinese customers with greater green knowledge evaluate environmental benefits more critically, possibly due to greater skepticism toward green practices. This interpretation is consistent with literature suggesting that higher

consumer knowledge can foster greater skepticism toward green claims (Chaudhary *et al.*, 2019), a dynamic that can emerge even within collectivist cultures (Amawate and Deb, 2021).

Finally, the multigroup analysis reveals cultural differences in how green hotel practices influence customer responses. Chinese customers show a stronger sensitivity to sustainability efforts, with green practices more effectively enhancing perceived benefits, reducing perceived costs and indirectly boosting revisit intentions. These findings suggest that collectivist orientations may be more receptive to a hotel's sustainability initiatives (Davari *et al.*, 2024). However, a contrasting pattern arises for the citizenship behavior–revisit intention link: although positive in both samples, it is significantly stronger among US guests. Thus, Chinese customers appear more reactive to green practices at the value-perception stage, whereas US customers convert enacted citizenship more effectively into loyalty intentions. This divergence may reflect the individualist emphasis on personal agency (Strebinger and Treiblmaier, 2022); in other words, engaging in citizenship behaviors creates a stronger psychological commitment to future patronage.

Theoretical contributions

This study significantly advances SET by providing a more sophisticated, two-dimensional model of perceived green value and identifying a key cognitive boundary condition that shapes this process. Responding to calls for a more nuanced understanding (e.g. Jiang and Kim, 2015), our findings first move beyond treating green value as an unidimensional construct. We reveal that green practices operate through a dual pathway, simultaneously enhancing specific benefits and influencing cost considerations. Thus, our study clarifies the conflicting perspectives in prior literature regarding the impact of green practices on perceived costs (Gössling *et al.*, 2019; Park *et al.*, 2024). More importantly, we uncover a nuanced dynamic: while green hotel practices have a more substantial direct impact on reducing perceived green costs, enhancing perceived green benefits ultimately proves the more potent driver of subsequent customer behavior.

Furthermore, we establish that this value calculation is contingent upon the consumer's cognitive resources. By demonstrating the moderating role of customer green knowledge, we show that knowledge is a perceptual filter, mitigating the perceived costs associated with a hotel's green practices. This finding contributes to SET, revealing knowledge's function in shaping the rational dimension within social exchange (Ahmad *et al.*, 2023). Together, these findings refine SET by showing that the cost-benefit analysis at its core is not only multifaceted (benefits vs costs), but also cognitively bounded, thereby enriching SET's explanatory power.

Additionally, we integrate SET with VCT to build a framework that bridges green hotel practice with the full spectrum of customer behavior. While SET effectively explains reciprocal behaviors based on perceived value (Cropanzano *et al.*, 2017), this study demonstrates that VCT complements SET by explaining how customers actively participate in value co-creation through green citizenship behaviors, thereby increasing revisit intention. Prior studies typically investigated in-role (revisit intention) and extra-role (citizenship behavior) outcomes separately (e.g. Wang *et al.*, 2024). We advance the literature by identifying a serial mediation pathway from green hotel practices through perceived benefits/costs to citizenship behavior, and ultimately to revisit intention. This pathway elucidates how customers first act as value receivers (per SET), and their subsequent citizenship behaviors position them as active value co-creators (per VCT), which, in turn, solidifies their in-role loyalty. This integrated perspective extends SET's traditional application in green hotel

contexts (Tran *et al.*, 2025), demonstrating how reciprocal exchange is not merely an endpoint but a structural antecedent to co-creation.

Moreover, this research offers a significant and nuanced contribution to the cross-cultural literature by challenging the assumption of a uniform impact of the individualism-collectivism dimension in green consumption. Our multigroup analysis shows that, while collectivist (Chinese) customers are more sensitive in their initial value perceptions of a hotel's green practices, individualist (US) customers demonstrate a stronger conversion of their own citizenship behaviors into loyalty. This finding reveals that cultural values do not have a uniform effect. Instead, their influence appears contingent on the specific psychological linkages: collectivism amplifying sensitivity to external cues (the hotel's green practices) and individualism strengthening the link between internal agency (one's own actions) and future commitment. This provides a more sophisticated understanding that moves beyond the general assumption that collectivistic cultures are uniformly more receptive to all aspects of green initiatives (Nosrati *et al.*, 2023).

Practical implications

This study offers several practical implications. First, managers must engineer a dual-pronged value proposition. For any practice that may imply a sacrifice, such as reduced housekeeping, communication must pivot from restriction to empowerment (e.g. "Join us in conserving water") and be paired with a tangible reward or transparently communicated benefit. More importantly, managers must amplify perceived benefits by translating sustainability features into tangible enhancements of the guest experience. Instead of merely listing eco-credentials, marketing should highlight outcomes: the superior sleep quality from organic linens, the vibrant taste of farm-to-table cuisine or the wellness benefits of nontoxic cleaning agents. Brands like 1 Hotels excel at seamlessly integrating biophilic design and sustainable materials as the core of their luxury wellness promise.

Second, hotel managers should structure opportunities for guests to become active co-creators of green value. For instance, luxury eco-resorts like Tierra Patagonia involve guests in rewilding projects, transforming a hotel stay into a participatory conservation experience. Urban hotels could create partnerships with local artists who upcycle hotel materials, with workshops offered to guests, or supply gamified apps that reward guests for achieving sustainability goals during their stay. By facilitating citizenship behaviors, hotels strengthen relational bonds and induce a powerful, self-reinforcing cycle of loyalty.

Third, hotel managers should tailor communication strategies to guests' environmental expertise. For knowledgeable guests, who value cost mitigation but scrutinize benefit claims, messages must be transparent, data-driven and authentic (e.g. eco-tours or impact reports like those at Soneva Fushi). For less knowledgeable guests, communication should be simple, emotionally engaging and focused on immediate personal benefits, such as "breathing cleaner air." Cultural context also matters: in collectivist cultures (e.g. China), green initiatives should emphasize communal benefits and social harmony, while in individualist cultures (e.g. the USA), messaging should highlight personal agency and self-expression. A "Personal Eco-Pledge" program, allowing guests to choose their contribution and receive personalized recognition, would resonate powerfully with this desire to make a unique impact.

Finally, as data-driven capabilities significantly amplify the effectiveness of a hotel's green strategy (Tuan, 2025), managers can leverage digital tools and AI to execute the aforementioned strategies with greater precision and scale. AI-driven platforms can segment guests based on past behavior to deliver personalized green messaging. Digital sensors, such as smart thermostats, can optimize resource use in real-time, mitigating perceived

inconvenience costs while achieving sustainability goals. Furthermore, interactive hotel apps or in-room QR codes can serve as real-time feedback channels, allowing managers to address concerns quickly and providing a digital platform for guests to exercise their citizenship behavior, thereby turning potential complaints into positive, co-creative engagement.

Limitations and future works

Despite its contributions, this study has limitations. First, “green hotel practices” are treated as a unidimensional construct, while recent literature highlights their multidimensional nature (e.g. energy-saving installations, sustainable architecture and guest-engaged programs). Examining their differential effects could reveal which practices most shape customer perceptions and behaviors. Second, customers’ green knowledge was measured based on self-perceptions. While a valid approach, future research could endeavor to distinguish between subjective and objective green knowledge, or explore different types (e.g. quality-vs process-based) to better understand their impact on customer evaluations of green initiatives.

Third, this study finds that perceived green costs have a stronger impact on behavior than perceived green benefits, highlighting the need to address barriers to green adoption. Future qualitative research (e.g. interviews, focus groups, could uncover the emotional and cognitive factors behind these perceptions, including concerns about greenwashing. Finally, while this study addressed both in-role and extra-role behaviors, the dynamic nature of consumer behavior warrants further exploration of its broader environmental impact (e.g. carbon footprint reduction or waste minimization).

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Supplementary material

The supplementary material for this article can be found online.

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