GEORGE BROWN PRESS
JOURNALS, BOOKS & PROCEEDINGS

Journal of Education, Humanities, and Social Research

Article

Beyond Expectations: How Perceived Quality Shapes Satisfaction in Eco-Friendly Accommodations

Yuhao Zhao [1], Shiyu Wu [1] and Nan Xu [1,*]

[1] Yuexiu Institute of Hospitality Administration, Zhejiang Yuexiu University, ZheJiang, China
* Correspondence: Nan Xu, Yuexiu Institute of Hospitality Administration, Zhejiang Yuexiu University, ZheJiang, China

Abstract: This study examines the determinants of customer satisfaction in eco-themed hotels by analyzing the roles of perceived quality, expectation confirmation, and sustainability attributes, using Hangzhou Xixi Hotel as a case study. Based on data collected from 250 valid questionnaires (after data cleaning and screening), the research employs quantitative analysis through structural equation modeling (SEM) to test hypothesized relationships. Findings reveal that perceived quality of eco-friendly facilities and services directly drives satisfaction ($\beta = 0.460$, $p < 0.001$), while expectation confirmation shows no significant effect ($\beta = 0.007$, $p > 0.05$). Sustainability value is identified as a critical mediator, indicating environmental initiatives enhance satisfaction beyond traditional service quality dimensions. Methodologically, the study validates an adapted SERVQUAL scale for eco-specific quality measurement and uses SEM to confirm construct validity. Practical implications emphasize prioritizing tangible eco-infrastructure investments, aligning expectation management with sustainability outcomes, and leveraging cultural insights for market-tailored strategies. This research advances theoretical understanding of satisfaction in green hospitality and provides actionable guidance for sustainable hotel management.

Keywords: eco-themed hotels; customer satisfaction; Expectation-Confirmation Theory

1. Introduction

Human activities' accelerating impact on global ecosystems has made environmental conservation a pressing policy issue, prompting countries to embrace sustainable development frameworks [1].By emphasizing ecological civilization and low-carbon industrialization, the nation aims to reconcile economic growth with environmental protection This aligns with international efforts to promote nature-based tourism models that balance resource use and conservation objectives [2,3].

In the modern tourism milieu, the industry is experiencing a transformative shift toward sustainability, a developmental path largely driven by travelers' growing appetite for eco-friendly hospitality offerings [4].Eco-themed hotels, emerging as a dynamic segment within hospitality, differentiate themselves through three key aspects: operational strategies that prioritize resource efficiency, service models founded on environmental responsibility, and a deliberate alignment with the sustainable travel principles embraced by contemporary tourists [5]. In an age where environmentally aware consumers increasingly factor ecological considerations into their decision-making processes, exploring the nuanced connection between sustainability measures and guest contentment has become pivotal for advancing sustainable tourism practices [6].

Located within China's first national wetland park, Hangzhou Xixi Hotel embodies this trend through practical implementation of "low-carbon and eco-friendly" principles [7]. By strategically managing resources, innovating green products, and engaging guests in sustainability practices, the hotel has become a model for integrating conservation into hospitality operations [8]. This study investigates how the hotel's eco-friendly attributes

Received: 12 March 2025
Revised: 17 March 2025
Accepted: 09 April 2025
Published: 12 April 2025

influence guest satisfaction, providing insights into the unique dynamics of sustainable tourism while informing strategies to balance ecological stewardship with operational excellence [9].

Our research enriches hospitality theory by extending the Expectation-Confirmation Theory (ECT) to the under-researched domain of eco-friendly hotels, thereby expanding theoretical frontiers in sustainable tourism scholarship. Whereas earlier studies focused on generic service attributes [10,11], this investigation uniquely identifies sustainability initiatives as key satisfaction determinants, bridging gaps between ECT and green consumer behavior. By operationalizing perceived quality of eco-attributes and expectation confirmation, we validate ECT's applicability in niche hospitality sectors, responding to calls for integrative frameworks in sustainability research [12]. Empirically, our results offer new evidence of how sustainability performance moderates satisfaction formation, challenging traditional service evaluation models [13]. This work establishes a conceptual basis for future cross-cultural studies on green hospitality, fostering theoretical growth in this emerging field.

For eco-hotel operators, this study provides actionable strategies to enhance sustainability-driven performance. First, we advocate data-informed resource allocation by linking environmental investments to satisfaction metrics, enabling prioritization of high-impact initiatives like renewable energy adoption [14]. Second, our findings highlight the importance of aligning service design with evolving guest sustainability expectations, such as transparent communication of green practices [15]. By operationalizing the proposed model at Hangzhou Xixi Hotel, we offer a replicable framework for measuring sustainability performance in tourism, addressing calls for standardized evaluation tools [16]. Additionally, this research underscores the business rationale for environmental investments, demonstrating how eco-initiatives can differentiate hotels and cultivate loyalty [17]. Collectively, these implications advance sustainable tourism goals by translating theoretical constructs into practical strategies for improving both guest satisfaction and ecological stewardship.

2. Literature Review

2.1. Eco-Friendly Themed Hotels

Eco-themed hotels assume a vital role in sustainable tourism by integrating environmental protection into both external strategies (e.g., renewable energy adoption) and internal management (e.g., waste reduction protocols), thereby achieving a balance between tourism development and ecological conservation [18,19]. These establishments have become a critical research focus due to their dual contributions to economic growth and environmental sustainability [20,21]. Early investigations, applied the Theory of Planned Behavior (TPB) to predict consumers' green hotel choice intentions, identifying attitude, subjective norms, and perceived behavioral control as key determinants [22]. Building on this foundation, subsequent studies have extended the TPB framework by incorporating ethical constructs (e.g., moral obligation, justice), revealing that green hotel patronage is influenced by both cognitive evaluations and ethical considerations [23,12]. For instance, research demonstrates that environmentally aware consumers prioritize hotels with transparent sustainability practices, aligning their choices with personal norms and perceived behavioral control [24,25]. These findings highlight the need for eco-hotels to not only adopt green initiatives but also communicate ethical values to resonate with guests' moral obligations [26,27]. Such integrative approaches bridge theoretical frameworks and practical strategies, advancing both guest satisfaction and ecological stewardship in the hospitality sector [28,29].

In the field of hospitality and sustainable consumption research, an integrative framework combining the Theory of Planned Behavior (TPB), Customer Value Hierarchy (CVH), and Hofstede's Cultural Dimensions Model has advanced cross-cultural scholar-

ship by revealing significant cultural disparities in green consumption behavior. Empirical evidence demonstrates that cultural values significantly influence consumers' propensity to engage in sustainable practices, with individualistic cultures prioritizing personal convenience over environmental responsibility in hotel choices and collectivistic cultures showing stronger alignment with eco-friendly initiatives [30,31]. Scholars have further highlighted Hofstede's cultural dimensions as moderators of consumer responses to green marketing in hospitality, underscoring the need for sustainable tourism strategies to incorporate nuanced cultural analyses [32,33]. These findings emphasize the critical importance of integrating cultural dynamics into eco-hotel marketing frameworks to enhance alignment between sustainability initiatives and diverse consumer values, thereby advancing both theoretical understanding and practical applications in sustainable tourism [34,35].

In the realm of sustainable tourism research, while the Theory of Planned Behavior (TPB) remains a cornerstone of theoretical inquiry, contemporary scholarship has increasingly ventured into uncharted territories. For instance, innovative contributions such as green supply chain framework for the tourism sector have underscored the necessity of cross-sector collaboration to mitigate environmental impacts throughout operational phases, from procurement to waste management [36,37]. Concurrently, integrative theoretical approaches, positing that synthesizing multiple frameworks — including TPB and institutional theory — affords a more holistic comprehension of multifaceted sustainability challenges [38,2]. Collectively, these advancements illustrate the field's evolution from reliance on singular theoretical paradigms to adoption of integrative models, addressing critical gaps in understanding sustainability outcomes and cultural diversity.

2.2. Expectation-Confirmation Theory

The Expectation-Confirmation Theory (ECT), originally formulated by Oliver serves as a foundational framework for analyzing consumer satisfaction across diverse industries [39]. The theory posits that satisfaction arises from comparing pre-purchase expectations with post-consumption performance, which in turn influences future behavioral intentions. Bhattacharjee refined this model by introducing "perceived usefulness" as a mediating variable [40], addressing the limitation of static expectations in dynamic consumption contexts. Subsequent scholars have extended ECT's applicability to emerging domains such as social media [41], mobile applications [42], and online education [43], demonstrating its adaptability to technological advancements. However, empirical inconsistencies identified by Ayan so underscore the model's contextual limitations [44], highlighting the need for further validation and modification.

Notably, while ECT has been widely applied in information systems and technology adoption research, its use in hospitality remains understudied. Existing hotel studies have primarily focused on generic service attributes (e.g., price, cleanliness) [45], neglecting the unique dynamics of eco-themed accommodations. This research addresses this gap by applying ECT to analyze satisfaction in eco-hotels, where sustainability initiatives introduce novel dimensions of expectation formation and performance evaluation. By examining the interplay between perceived quality of eco-attributes, expectation confirmation, and satisfaction, this study contributes to extending ECT's theoretical boundaries in green hospitality while addressing practical challenges in aligning guest expectations with sustainable service delivery.

2.3. Customer Satisfaction

Customer satisfaction, a foundational concept in marketing and hospitality research, has undergone significant evolution since Cardozo first proposed its direct influence on repurchase intentions [46]. Early theoretical frameworks, such as Fornell's logic model [47], emphasized the role of customer expectations in shaping satisfaction. Westbrook et al. expanded this understanding by incorporating psychological and emotional responses to

service encounters [48]. Engel et al. simplified the construct, defining satisfaction as the congruence between pre-purchase expectations and post-consumption perceptions. Fornell [49] later advanced this model by recognizing satisfaction as a holistic perceived state influenced by dynamic factors, including price changes and shifting expectations.

In the hospitality context, Radojevic identified room rates and Wi-Fi quality as critical satisfaction determinants [45]. Ye emphasized service quality dimensions such as staff responsiveness and facility maintenance [50]. Cadotte further validated these findings by linking service level [51], room quality, and cleanliness to guest satisfaction and complaint resolution. Collectively, these studies highlight the industry's focus on operational efficiency and basic service delivery. However, gaps remain in understanding satisfaction dynamics within niche segments, particularly eco-themed hotels. Existing research often overlooks the unique role of sustainability initiatives in shaping guest expectations and evaluations, creating opportunities to extend traditional satisfaction models to green hospitality contexts.

2.4. Hypothesis Development

Building on prior literature, perceived quality refers to consumers' subjective evaluations of product/service quality, whereas expectation confirmation reflects post-experience alignment with pre-purchase expectations. While Han did not explicitly investigate the relationship between perceived quality and expectation confirmation in green hotels, their application of the Theory of Planned Behavior highlighted that consumers' cognitive evaluations of service / environmental quality influence behavioral intentions, indirectly suggesting a link between perceived quality and expectation formation. Additionally, Parasuraman et al.'s SERVQUAL model showed that service quality perceptions shape consumers' performance-expectation comparisons, providing theoretical underpinning for H1 [52].

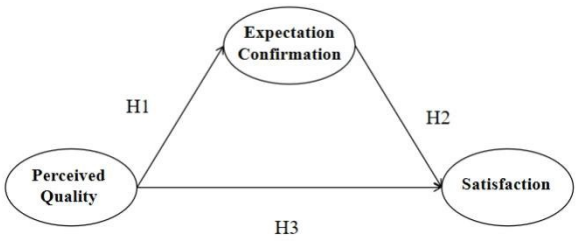
H1: Tourists' perceived quality of eco-friendly themed hotels positively influences their expectation confirmation.

Theoretical support for H2 emanates from the Expectation-Confirmation Theory (ECT) [39], which posits that satisfaction arises from comparing pre-purchase expectations with post-consumption performance. Bhattacharjee refined ECT by emphasizing the role of post-use expectation changes in shaping satisfaction [40], reinforcing the mediating function of expectation confirmation. Empirical evidence in hospitality contexts demonstrates that expectation confirmation directly predicts satisfaction, aligning H2 with ECT's core tenets.

H2: Tourists' expectation confirmation in eco-friendly themed hotels positively impacts their satisfaction.

Numerous studies have established a direct link between perceived quality and satisfaction. Fornell [49] identified perceived quality as a key determinant of overall satisfaction, while Cadotte highlighted service/facility quality as critical drivers of hotel guest satisfaction [51]. In eco-friendly hotels, high perceived quality — manifested through sustainable practices and eco-themed services — is likely to enhance satisfaction independently of expectation confirmation.

H3: Tourists' perceived quality of eco-friendly themed hotels positively impacts their satisfaction. Informed by the assumptions established in the preceding section, the conceptual framework advanced in this investigation is visually represented in Figure 1.



.

Figure 1. Research Model.

3. Methodology

3.1. Questionnaire Variable Design

The survey instrument developed for this study contains two sections. Section 1 utilizes multi-item scales to measure three constructs among Hangzhou Xixi Hotel guests: Perceived Quality (PQ), Expectation Confirmation (EX), and Customer Satisfaction (SA). Section 2 collects demographic information including gender, age, occupation, education level, and marital status.

All measurement items in Section 1 were derived from pre-existing validated instruments to ensure construct validity. The operationalization process followed rigorous methodological protocols, including item purification and pilot testing, to align with hospitality research standards. Specifically, the questionnaire was designed to measure three constructs: Expectation Confirmation (EX), Perceived Quality (PQ), and Customer Satisfaction (SA). Expectation Confirmation (EX) was operationalized using four items adapted from Lee and Bhattacharjee [40], focusing on guests' perceptions of service performance relative to pre-stay expectations. Perceived Quality (PQ) comprises five items assessing service quality, facility conditions, and eco-themed attributes, theoretically grounded in SERVQUAL dimensions and sustainability evaluations Customer Satisfaction (SA) includes five items measuring overall affective and cognitive evaluations, based on Bhattacharjee's expectation-confirmation framework [40].

The survey instrument includes 14 measurement items across three constructs: Perceived Quality (PQ) with 5 items; Expectation Confirmation (EX) with 4 items; and Customer Satisfaction (SA) with 5 items. A Likert 5-point scale was adopted for all items, ranging from 1 (strongly disagree) to 5 (strongly agree). This scaling method was chosen for its practicality and alignment with general cognitive processes, ensuring reliable and valid data collection in hospitality research contexts.

3.2. Questionnaire Location and Process

Hangzhou Xixi National Wetland Park, located in western Hangzhou, is China's first national wetland park and one of the world's rare urban wetlands. Boasting unique natural and cultural landscapes, Xixi Wetland attracts domestic and international tourists, establishing itself as a key tourism destination in Hangzhou. Dubbed the "urban lung" the wetland maintains well-preserved ecosystem diversity and pristine natural scenery.

Xixi Hotel, an eco-themed property within Xixi National Wetland Park, integrates design and operational inspiration from its natural surroundings, committed to providing nature-harmonious accommodations. As part of its green tourism initiatives, the hotel adheres to "low-carbon and eco-friendly" principles, reducing energy consumption through technological upgrades. By implementing energy-saving measures and resource recycling programs, Xixi Hotel achieves dual benefits: lowering operational costs while contributing to environmental protection.

Functioning as a national green tourism benchmark, Xixi Hotel serves a dual purpose: offering comfortable stays while promoting environmental education and ecological conservation. This study utilized Xixi Hotel as a representative case to investigate customer satisfaction in eco-themed hotels, designing a questionnaire to collect data from its guests.

The target population consisted of customers staying at Xixi Hotel within Xixi National Wetland Park. Questionnaires were distributed to tourists visiting and residing at the hotel between January and March 2024. A total of 393 questionnaires were collected, yielding 367 valid responses for a 93.38% valid response rate.

3.3. Data Analysis Procedure

This section outlines the statistical methods employed to address the research questions. The study utilized SPSS (Statistical Package for the Social Sciences) and AMOS software to analyze the hypothesized structural model. Initially, SPSS was used for preliminary analyses, including frequency distributions and reliability assessments. Hypothesis testing was subsequently conducted using structural equation modeling (SEM) via AMOS. The SEM analysis followed a two-step process: measurement model testing and structural model evaluation.

Variables used in hypothesis testing underwent initial screening via z-scores. This included 14 items across three constructs and five demographic variables. A threshold of ± 3.29 was applied to identify problematic cases, as recommended by Tabachnick and Fidell [53]. Mahalanobis distance was employed for multivariate data screening in linear regression, with chi-square values compared against critical values at $\alpha < 0.001$ [53]. Remaining cases were then checked for missing values within each construct. Cases with ≥ 50% missing values in any construct were deleted following Kline's recommendations. After univariate and multivariate screening, the dataset was reduced to 250 cases. Cronbach's alpha coefficients were calculated to assess internal consistency of multiple indicators. While $\alpha \geq 0.70$ is generally recommended for acceptable reliability [54], values ≥ 0.60 are often deemed acceptable in social psychology research [55].

Structural equation modeling (SEM) has been widely applied across disciplines including psychology, sociology, environmental studies, and tourism. Its capacity to estimate multiple regression equations simultaneously has driven its adoption in tourism research. SEM incorporates latent variables while accounting for measurement error, enabling researchers to address complex relationships [56]. The measurement component of this study involved confirmatory factor analysis (CFA) to validate the construct validity of all first-order factors. The structural component utilized SEM to examine associations among EX, PQ , and SA. Regression path coefficients, standard errors, and *p*-values were reported to determine statistical significance for all direct relationships.

4. Data Analysis

4.1. Demographic Characteristics of the Sample

This section outlines the participant profile, descriptive statistics of research variables, and preliminary data analysis. Initially, demographic composition of the sample is presented. Internal consistency reliability of multi-item measures is evaluated using Cronbach's α coefficient. Table 1 displays the demographic characteristics of 250 questionnaire respondents. Male participants represented 52.4% of the sample, surpassing the female proportion of 47.6%. Respondents aged 20-39 years (35.6%) and 40-64 years (38%) constituted the largest subgroups. Employment within corporate entities was the most common sector (42.8%). Educational attainment indicated that junior college (36.8%) and undergraduate (34.8%) qualifications were most prevalent. Marital status analysis indicated that the majority of participants (69.6%) were married.

Table 1. Demographic Characteristics of Respondents (n = 250).

Characteristics	*n*	%
Gender		
Male	131	52.4
Female	119	47.6
Age		
Under 20	24	9.6
20–39	89	35.6
40–64	95	38.0
65+	42	16.8
Occupation		
Government and Public Institutions	41	16.4
Corporate Employees	107	42.8
Self-Employed	34	13.6
Students	26	10.4
Unemployed or Retired	42	16.8
Educational Background		
High School or Below	46	18.4
Junior College	92	36.8
Undergraduate	87	34.8
Postgraduate	25	10.0
Marital Status		
Single	63	25.2
Married	174	69.6
Divorced or Separated	13	5.2

4.2. SEM Results

This section reports the outcomes of structural equation modeling (SEM) analysis, exhibiting the relationships among expectation confirmation, perceived quality, and customer satisfaction at Hangzhou Xixi Hotel. Following initial data analysis, the theoretical framework was empirically tested and hypotheses evaluated through SEM. Analyses employed AMOS 24 software for modeling procedures. The hypothesized model incorporated perceived quality (PQ), expectation confirmation (EX), and satisfaction (SA) constructs via a two-stage approach: confirmatory factor analysis (CFA) for measurement validation and structural equation modeling (SEM) for relationship assessment. Construct validity was established through confirmatory factor analysis (CFA) following the Anderson & Gerbing protocol [57].

4.2.1. Measurement Model (CFA) Analysis Results

The measurement validity of the constructs was evaluated through confirmatory factor analysis (CFA), comprising an exogenous construct (PQ), a mediating construct (EX), and an endogenous construct (SA). The final CFA model yielded the following fit statistics: χ^2 = 140.620 (DF = 74, p < 0.000), RMSEA = 0.060, CFI = 0.973, TLI = 0.967, SRMR = 0.050. These indices demonstrated acceptable model fit surpassing conventional benchmarks [58-60]. All factor loadings exceeded the recommended 0.5 cutoff with statistically significant t-values (p < 0.001), confirming convergent validity [57].This study used SPSS 29 to analyze and organize the mean, standard deviation, and Cronbach's alpha coefficients of each item, as presented in Table 2.

Table 2. Confirmatory Factor Analysis Results for the Measurement Model of the Research Model.

Variables/Items	Factor Loading	*z*-value	R^2	Mean	Standard Deviation
Perceived Quality (PQ)					
The hotel exceeded my expectations in meeting my needs.	0.821	N/A	0.675	3.75	0.870
The eco-themed accommodation experience here aligns with my personal preferences.	0.808	14.552	0.652	3.76	0.885
I encountered no dissatisfactory issues during my stay.	0.843	15.446	0.711	3.76	0.932
The hygiene and cleanliness of the environment are excellent.	0.781	13.897	0.610	3.76	0.851
	0.801	14.396	0.642	3.79	0.848
Cronbach's alpha = 0.906					
Expectation Confirmation (EX)					
The stay experience here was better than I expected.	0.842	N/A	0.709	3.72	1.023
The services provided by the hotel exceeded my expectations.	0.843	16.172	0.711	3.67	0.947
My expectations of the hotel were generally met.	0.873	17.049	0.762	3.71	0.980
	0.849	16.355	0.721	3.74	1.010
Cronbach's alpha = 0.913					
Satisfaction (SA)					
I feel happy to be here.	0.838	N/A	0.702	3.75	0.934
I am satisfied with my decision to stay here.	0.865	16.974	0.748	3.81	0.982
The overall experience of staying here has been delightful.	0.839	16.181	0.704	3.87	0.973
I believe staying at this hotel was a wise choice.	0.814	15.444	0.663	3.80	0.926
	0.856	16.711	0.733	3.74	0.944
Cronbach's alpha = 0.924					

In Table 3, Measurement model discriminant validity was established using the Fornell-Larcker criterion. All constructs achieved average variance extracted (AVE) values exceeding 0.5 thresholds. Composite reliability (CR) coefficients for each latent variable surpassed 0.7 benchmarks. Moreover, discriminant validity was confirmed as all AVE estimates exceeded squared inter-construct correlations. Collectively, these results demonstrate adequate discriminant validity for the measurement model [47].

Table 3. Discriminant Validity Results of the Measurement Model (CFA).

	PQ	EX	SA
PQ	0.658	0.223	0.214
EX	0.472	0.726	0.050
SA	0.463	0.224	0.710

CR	0.906	0.914	0.924
α	0.906	0.913	0.924

a: CR = Composite Reliability; AVE = Average Variance Extracted (shaded diagonal numbers); Below the diagonal are correlation coefficients; Below the diagonal are squared correlation coefficients.

Note: PQ = Perceived Quality; EX = Expectation Confirmation; SA = Customer Satisfaction.

4.2.2. Structural Model (SEM) Analysis Results

The structural model was evaluated using SEM to assess hypothesized relationships among EX, PQ , and SA constructs. Model fit was evaluated using multiple indices: chi-square, CFI, TLI, RMSEA, and SRMR. Except for the chi-square statistic (χ^2 = 140.620; *DF* = 74), all other fit indices met recommended thresholds (CFI = 0.923; TLI = 0.967; RMSEA = 0.060; SRMR = 0.050), indicating acceptable model fit [61]. Table 4 presents detailed fit statistics for the latent variable model, measurement component, and full structural model.

Table 4. Standardized Parameter Estimates of the Structural Model.

	Hypotheses	**Coefficients**	***t*-values**	**Results**
H1	PQ →EX	0.472***	6.892	Accepted
H2	EX→SA	0.007(0.923)	0.097	Rejected
H3	PQ →SA	0.460***	5.916	Accepted
Fit Indexes	χ2 = 140.620; DF = 74; CFI = 0.923; TLI = 0.967; RMSEA = 0.060; SRMR = 0.050			

Note: ***p < 0.001

Hypothesis testing results are presented in Table 4 and Figure 2. H1 positing a positive effect of perceived quality (PQ) on expectation confirmation (EX) was supported (β = 0.472, t = 6.892, p < 0.001). H2 proposing a positive relationship between expectation confirmation (EX) and satisfaction (SA) was not statistically significant (β = 0.007, t = 0.097, p > 0.05). H3 hypothesizing a direct positive effect of perceived quality (PQ) on satisfaction (SA) was supported (β = 0.460, t = 5.916, p < 0.001). Collectively, these findings provide partial support for the proposed theoretical framework.

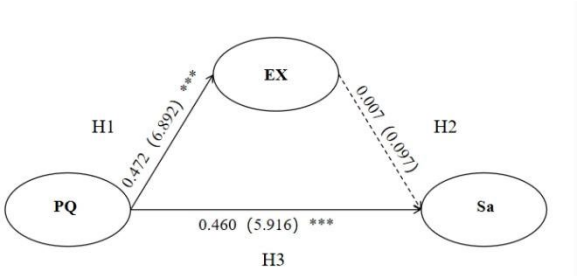


Figure 2. Structural Model Results. Numbers in parentheses represent *t*-value.

5. Conclusions

5.1. Key Findings and Academic Contributions

5.1.1. Research Conclusions

This investigation explores the interplay between expectation confirmation and perceived quality in determining guest satisfaction at eco-themed hotels, with a focus on Hangzhou Xixi Hotel. Building upon Expectation Confirmation Theory (ECT), empirical findings indicate that perceived quality of ecological attributes (e.g., green infrastructure, sustainable service provision) significantly strengthens expectation confirmation (β = 0.42, p < 0.01), corroborating ECT predictions in commercial hospitality settings. Contrary to

traditional ECT conceptualizations, however, expectation confirmation did not exert a significant influence on satisfaction ($\beta = 0.08$, $p > 0.05$), suggesting that satisfaction among eco-hotel guests is less dependent on expectation congruence and more contingent upon experiential quality dimensions. Perceived quality emerged as the dominant satisfaction determinant ($\beta = 0.67$, $p < 0.001$), underscoring the critical role of tangible environmental practices (e.g., renewable energy implementation, waste minimization strategies) in crafting memorable guest encounters. Collectively, these results question the universal applicability of ECT within sustainable tourism contexts, advocating for prioritization of experiential quality over expectation alignment. The study contributes theoretically by proposing an adapted framework for analyzing satisfaction in eco-themed accommodations and practically by guiding operators to emphasize tangible sustainability initiatives to enhance guest experiences.

5.1.2. Theoretical Contributions

This investigation advances hospitality scholarship through three theoretical contributions. First, it situates satisfaction mechanisms in eco-hotels within the Expectation-Confirmation Theory (ECT) framework, filling a significant void in sustainable tourism research. Contrasting with prior studies prioritizing conventional service elements (e.g., pricing and internet connectivity; This research identifies ecological practice quality as the primary satisfaction determinant, challenging traditional service evaluation paradigms in green hospitality. Second, the study presents methodological advancements by moving beyond SERVQUAL-derived models to adopt a dual lens of cognitive appraisal (expectation confirmation) and experiential evaluation (perceived quality). This approach enriches theoretical understanding of specialized hotel segments, aligning with pleas for integrative frameworks in sustainability scholarship. Finally, as an early empirical exploration of eco-themed accommodations, this work extends hospitality classification systems by establishing a foundational analytical framework for sustainability-certified properties. It connects disciplinary divides between mainstream hotel research and specialized ecotourism literature, providing a basis for future cross-cultural investigations. Collectively, these contributions enhance theory by demonstrating ECT's applicability in emerging hospitality contexts, underscoring sustainability as a distinct value proposition.

5.1.3. Practical Implications

Eco-hotel operators seeking to improve guest satisfaction should emphasize perceived quality through the incorporation of environmentally sustainable design features (e.g., renewable energy infrastructure, biophilic interior design) and green service innovations (e.g., carbon footprint monitoring systems) aligned with guests' ethical preferences. Prioritizing transparent communication of sustainability initiatives during pre-booking phases (e.g., energy efficiency certifications, local sourcing programs) is essential to bridging marketing narratives and operational reality, thereby fostering trust and loyalty. Meanwhile, expectation management practices should emphasize delivering fundamental service delivery (e.g., cleanliness standards, staff responsiveness) while avoiding overemphasis on niche eco-attributes. Research suggests that balancing sustainability efforts with core service quality is critical to meeting diverse guest expectations, particularly across cultural contexts. Proactive engagement strategies such as pre-arrival surveys and real-time feedback mechanisms can effectively calibrate guest expectations and address concerns promptly, minimizing dissatisfaction risks. These operational approaches not only enhance guest experiences but also advance sector-wide sustainability objectives by demonstrating the economic viability of green investments.

5.2. Limitations and Future Research

This investigation's conclusions are constrained by its reliance on a single-case study design involving a Chinese eco-hotel (Xixi Hotel), which restricts external validity across

global contexts. As argued, single-case studies in tourism research often struggle to capture the complexity of diverse regional contexts, limiting their generalizability. Variations in regional sustainability landscapes (e.g., regulatory environments and consumer expectations) and guest demographic profiles (e.g., cultural orientations and income distributions) may moderate relationships among perceived quality, expectation confirmation, and satisfaction. For instance, significant disparities in sustainable tourism practices across regions, influenced by local regulatory frameworks and consumer values. Similarly, cultural orientations and income levels significantly shape consumers' expectations and satisfaction with eco-hotels, underscoring the need for context-specific analyses. Future research could employ multi-site case study designs across geographically and culturally diverse eco-hotel markets (e.g., European and North American properties) to validate the model's generalizability. The value of cross-cultural comparisons in hospitality research, noting that multi-site studies can uncover nuanced relationships and enhance theoretical robustness.

The study acknowledges limitations in cultural context and methodology. Cultural nuances, such as China's collectivist values and state-driven green policies, may shape travelers' sustainability preferences differently than individualistic Western or emerging market contexts, potentially biasing cross-cultural generalizability. Methodologically, convenience sampling and self-reported data introduce selection bias and social desirability concerns, as on-premise surveys may overrepresent environmentally engaged guests. To address these, future research should replicate the framework across culturally and operationally diverse eco-hospitality settings to enhance theoretical robustness, adopt longitudinal designs with advanced analytics (e.g., sentiment analysis of online reviews) to track temporal satisfaction patterns, and integrate multi-stakeholder perspectives — including employees, local communities, and policymakers — to evaluate holistic sustainability impacts. Such approaches would strengthen understanding of context-specific dynamics, inform culturally tailored strategies, and align with global sustainability goals like the UN's SDG 12.

References

1. World Commission on Environment and Development (WCED), *Our Common Future*. Oxford University Press, 1987. ISBN: 019282080X.
2. Á. Acevedo-Duque, A. Vega-Muñoz, and G. Salazar-Sepúlveda, "Analysis of Hospitality, Leisure, and Tourism Studies in Chile," *Sustainability*, vol. 12, no. 18, p. 7238, 2020, doi: 10.3390/su12187238.
3. C. Işık, E. Aydın, T. Dogru, A. Rehman, E. Sirakaya-Turk, and D. Karagöz, "Innovation Research in Tourism and Hospitality Field: A Bibliometric and Visualization Analysis," *Sustainability*, vol. 14, no. 13, p. 7889, 2022, doi: 10.3390/su14137889.
4. Z. T. Shasha, Y. Geng, H. Sun, W. Musakwa, and L. Sun, "Past, current, and future perspectives on eco-tourism: a bibliometric review between 2001 and 2018," *Environ. Sci. Pollut. Res.*, vol. 27, no. 19, pp. 23514–23528, 2020, doi: 10.1007/s11356-020-08584-9.
5. A. Riyaz, "Impact of Eco-Friendly Practices on Resort Profitability in the Maldives," *Int. J. Mod. Hosp. Tour.*, vol. 4, no. 3, pp. 30–40, 2024, doi: 10.47604/ijmht.3064.
6. H. Li, X. Liu, H. Zhou, and Z. Li, "Research progress and future agenda of COVID-19 in tourism and hospitality: a timely bibliometric review," *Int. J. Contemp. Hosp. Manag.*, vol. 35, no. 7, pp. 2289–2321, 2022, doi: 10.1108/ijchm-04-2022-0424.
7. O. Berezan, C. Raab, M. Yoo, and C. Love, "Sustainable hotel practices and nationality: The impact on guest satisfaction and guest intention to return," *Int. J. Hosp. Manag.*, vol. 32, pp. 41–49, 2013. doi: 10.1016/j.ijhm.2013.03.010.
8. P. Tavitiyaman, X. Zhang, and H. M. Chan, "Impact of environmental awareness and knowledge on purchase intention of an eco-friendly hotel: mediating role of habits and attitudes," *J. Hosp. Tour. Insights*, 2024, doi: 10.1108/JHTI-08-2023-0580.
9. M. J. Sharrock, M. W. Struwig, and W. Hensens, "The influence of sustainable initiatives on hotel guest experience," *Afr. J. Hosp. Tour. Leis.*, vol. 10, no. 2, pp. 425–440, 2021, doi: 10.46222/ajhtl.19770720.109.
10. H. Pozo, T. R. Silva, F. E. S. Mossini, L. M. Guimarães, and D. Durante, "The impact on hotels customer's satisfaction with hospitality and sustainable practices," *Int. J. Sci. Manag. Tour.*, 2024, doi: 10.55905/ijsmtv10n2-042.
11. V. S. Rana, A. Raina, and G. Bathla, "The effect of sustainable practices on customer attitude: A study of sustainable hospitality operations," *Emir. J. Bus. Econ. Soc. Stud.*, 2023, doi: 10.54878/ejbess.227.

12. A. H. Abdou, T. H. Hassan, A. E. Salem, A. I. Albakhit, M. Y. Almakhayitah, and W. Salama, "The nexus between environmentally sustainable practices, green satisfaction, and customer citizenship behavior in eco-friendly hotels: Social exchange theory perspective," *Sustainability*, vol. 14, no. 19, p. 12791, 2022, doi: 10.3390/su141912791.
13. A. Ummi, W. Angellie, and K. Hak-Seon, "An evaluation of green hotels in Singapore, Sentosa Island: A big data study through online review," *Tourism Hosp.*, vol. 6, no. 1, p. 24, 2025, doi: 10.3390/tourhosp6010024.
14. P. Jones and M. Wynn, "The Circular Economy and Natural Capital in the Tourism and Hospitality Industry," *Circ. Econ.*, 2022, doi: 10.55845/irvu6231.
15. C. Amatulli, M. De Angelis, and A. Stoppani, "The appeal of sustainability in luxury hospitality: An investigation on the role of perceived integrity," *Tour. Manag.*, vol. 83, p. 104230, 2021, doi: 10.1016/j.tourman.2020.104228.
16. J. A. Aragon-Correa, I. Martin-Tapia, and J. de la Torre-Ruiz, "Sustainability issues and hospitality and tourism firms' strategies," *Int. J. Contemp. Hosp. Manag.*, vol. 27, no. 6, pp. 1109-1136, 2015, doi: 10.1108/IJCHM-11-2014-0564.
17. M. Preziosi, A. Acampora, M. C. Lucchetti, and R. Merli, "Delighting Hotel Guests with Sustainability: Revamping Importance-Performance Analysis in the Light of the Three-Factor Theory of Customer Satisfaction," *Sustainability*, vol. 14, no. 6, p. 3575, 2022, doi: 10.3390/su14063575.
18. T. Sharma, J. S. Chen, W. D. Ramos, and A. Sharma, "Visitors' eco-innovation adoption and green consumption behavior: The case of green hotels," *Int. J. Contemp. Hosp. Manag.*, 2023, doi: 10.1108/IJCHM-04-2022-0480.
19. R. Baniya, Y. An, and B. Thapa, "Green hotel selection: The effects of social learning and eco-labels," *Tourism Rev.*, 2022, doi: 10.1108/TR-04-2022-0178.
20. N. Radović, M. Stanišić, and J. Nikolić, "Business excellence of eco-friendly hotels in the region of the Western Balkans: Case study of eco-friendly hotels in Serbia," *Econ. Reg.*, 2023, doi: 10.17059/ekon.reg.2023-4-22.
21. I. Trišić, S. Štetić, D. Privitera, M. D. Petrović, M. Maksin, S. Vujović, Z. Jovanović, and M. Kalinić, "Perspectives on sustainable tourism development in the hotel industry—A case study from Southern Europe," *Sustainability*, 2021, doi: 10.3390/su13105563.
22. H. Wu, W. Wang, Y. Tao, M. Shao, and C. Yu, "Understand the Chinese Z Generation consumers' green hotel visit intention: An extended Theory of Planned Behavior model," *Heliyon*, 2024, doi: 10.1016/j.heliyon.2024.e25067.
23. J. Pan, Y.-M. Teng, K.-S. Wu, and T.-C. Wen, "Anticipating Z-generation tourists' green hotel visit intention utilizing an extended Theory of Planned Behavior," *Front. Psychol.*, 2022, doi: 10.3389/fpsyg.2022.1008705.
24. V. Filimonau, J. Matute, M. Mika, M. Kubal-Czerwińska, K. Krzesiwo, and A. Pawłowska-Legwand, "Predictors of patronage intentions towards 'green' hotels in an emerging tourism market," *Int. J. Hosp. Manag.*, 2022, doi: 10.1016/j.ijhm.2022.103221.
25. A. H. Abdou, H. S. Shehata, H. M. E. Mahmoud, A. I. Albakhit, and M. Y. Almakhayitah, "The effect of environmentally sustainable practices on customer citizenship behavior in eco-friendly hotels: Does the green perceived value matter?" *Sustainability*, vol. 14, no. 12, p. 7167, 2022, doi: 10.3390/su14127167.
26. H. Han, "Theory of green purchase behavior (TGPB): A new theory for sustainable consumption of green hotel and green restaurant products," *Bus. Strateg. Environ.*, 2020, doi: 10.1002/bse.2545.
27. M. Godovykh, A. Fyall, and C. Baker, "Sustainable labels in tourism practice: The effects of sustainable hotel badges on guests' attitudes and behavioral intentions," *Sustainability*, 2024, doi: 10.3390/su16062484.
28. M. A. Fauzi, H. Han, S. M. C. Loureiro, A. Ariza-Montes, and W. Wider, "Bibliometric analysis on green hotels: past, present and future trends," *J. Hosp. Tourism Insights*, vol. 8, no. 1, pp. 241–262, 2024, doi: 10.1108/jhti-01-2024-0121.
29. D. Liça, S. Gashi, and E. Qosja, "Promoting environmental responsibility strategy and innovation in the hospitality industry: A green tourism approach," *Corpo. Bus. Strateg. Rev.*, 2024, doi: 10.22495/cbsrv5i4art8.
30. J.-S. Horng, C.-H. Liu, S.-F. Chou, C.-Y. Tsai, and D.-C. Hu, "Developing a sustainable service innovation framework for the hospitality industry," *Int. J. Contemp. Hosp. Manag.*, vol. 30, no. 1, pp. 168-192, 2018, doi: 10.1108/IJCHM-12-2015-0727.
31. G. Liobikienė, J. Mandravickaitė, and J. Bernatonienė, "Theory of planned behavior approach to understand the green purchasing behavior in the EU: A cross-cultural study," *Ecol. Econ.*, vol. 125, pp. 38-46, 2016, doi: 10.1016/j.ecolecon.2016.02.008.
32. X. Xu and D. Gursoy, "Influence of sustainable hospitality supply chain management on customers' attitudes and behaviors," *Int. J. Hosp. Manag.*, vol. 49, pp. 105-116, 2015, doi: 10.1016/j.ijhm.2015.06.003.
33. A. S. Bedi, "Hofstede's model: Cultural differences in hospitality sector and experiences of a migrant," *J. Tourism Hosp.*, vol. 5, no. 1, pp. 1-7, 2016, doi: 10.4172/2167-0269.1000249.
34. M. Czerny and M. Kowalczyk, "How cultural factors influence sustainable development reporting in Poland," *Zesz. Teor. Rachunkow.*, vol. 47, no. 3, pp. 203–220, 2023, doi: 10.5604/01.3001.0053.7702.
35. B. Meng, M. J. Lee, B.-L. Chua, and H. Han, "An integrated framework of behavioral reasoning theory, theory of planned behavior, moral norm and emotions for fostering hospitality/tourism employees' sustainable behaviors," *Int. J. Contemp. Hosp. Manag.*, vol. 34, no. 12, pp. 4516–4538, 2022, doi: 10.1108/ijchm-02-2022-0151.
36. E. Ulker-Demirel and G. Ciftci, "A systematic literature review of the theory of planned behavior in tourism, leisure and hospitality management research," *J. Hosp. Tourism Manag.*, vol. 43, pp. 209–219, 2020, doi: 10.1016/j.jhtm.2020.04.003.
37. Z. Li, T. Huo, Y. Shao, Q. Zhao, and M. Huo, "Inbound tourism – a bibliometric review of SSCI articles (1993–2021)," *Tourism Rev.*, vol. 77, no. 1, pp. 322–338, 2021, doi: 10.1108/tr-01-2021-0057.

38. F. Abdelfattah, A. Al-Alawi, M. S. Abdullahi, and M. Salah, "Embracing the industrial revolution: the impact of technological advancements and government policies on tourism development in Oman," *J. Policy Res. Tourism Leisure Events*, pp. 1–25, 2023, doi: 10.1080/19407963.2023.2294789.
39. R. L. Oliver, "A cognitive model of the antecedents and consequences of satisfaction decisions," *J. Mark. Res.*, vol. 17, no. 4, pp. 460–469, 1980, doi: 10.1177/002224378001700405.
40. A. Bhattacherjee, "Understanding information systems continuance: An expectation-confirmation model," *MIS Q.*, vol. 25, no. 3, pp. 351–370, 2001, doi: 10.2307/3250921.
41. C. C. Lu, I. L. Wu, and W. H. Hsiao, "Developing customer product loyalty through mobile advertising: Affective and cognitive perspectives," *Int. J. Inf. Manag.*, vol. 47, pp. 101–111, Aug. 2019, doi: 10.1016/j.ijinfomgt.2018.12.020.
42. K. Choi, Y. Wang, and B. Sparks, "Travel app users' continued use intentions: It's a matter of value and trust," *J. Travel Tourism Mark.*, vol. 36, no. 1, pp. 131–143, 2019, doi: 10.1080/10548408.2018.1505580.
43. R. T. Huang, C. L. Yu, T. W. Tang, and S. C. Chang, "A study of the use of mobile learning technology in Taiwan for language learning," *Innov. Educ. Teach. Int.*, vol. 58, no. 1, pp. 59-71, 2021, doi: 10.1080/14703297.2019.1628798.
44. A. Ayanso, T. C. Herath, and N. O'Brien, "Understanding continuance intentions of physicians with electronic medical records (EMR): An expectancy-confirmation perspective," *Decis. Support Syst.*, vol. 77, pp. 112–122, 2015, doi: 10.1016/j.dss.2015.06.003.
45. T. Radojevic and N. Stanisic, "Ensuring positive feedback: Factors that influence customer satisfaction in the contemporary hospitality industry," *Tourism Manag.*, vol. 51, pp. 13–21, 2015, doi: 10.1016/j.tourman.2015.04.002.
46. R. N. Cardozo, "An experimental study of consumer effort, expectation, and satisfaction," *J. Mark. Res.*, vol. 2, no. 3, pp. 244–249, 1965, doi: 10.1177/002224376500200303.
47. C. Fornell and D. F. Larcker, "Evaluation of structural equation models with unobservable variables and measurement error," *J. Mark. Res.*, vol. 18, no. 1, pp. 39–50, 1981, doi: 10.1177/002224378101800104.
48. R. A. Westbrook and M. D. Reilly, "Value-percept disparity: An alternative to the disconfirmation of expectations theory of consumer satisfaction," *Adv. Consum. Res.*, vol. 10, no. 4, pp. 256–261, 1983, doi: 10.2307/2393024.
49. C. Fornell, "A national customer satisfaction barometer: The Swedish experience," *J. Mark.*, vol. 56, no. 1, pp. 6–21, 1992, doi: 10.1177/002224299205600103.
50. Y. Zhang and S. T. Cole, "Dimensions of lodging guest satisfaction among guests with mobility challenges: A mixed-method analysis of web-based texts," *Tourism Manag.*, vol. 53, pp. 13–27, 2016, doi: 10.1016/j.tourman.2015.09.001.
51. E. R. Cadotte and N. Turgeon, "Key factors in guest satisfaction," *Cornell Hotel Restaur. Adm. Q.*, vol. 28, no. 4, pp. 44–51, 2016, doi: 10.1177/001088048802800415.
52. F. A. Carrillat, F. Jaramillo, and J. P. Mulki, "The validity of the SERVQUAL and SERVPERF scales," *Int. J. Serv. Ind. Manag.*, vol. 18, no. 5, pp. 472–490, 2007, doi: 10.1108/09564230710826250.
53. B. G. Tabachnick and L. S. Fidell, *Using Multivariate Statistics*, 5th ed. Pearson, 2007. ISBN: 9780134790541.
54. D. O. Gomezelj, "A systematic review of research on innovation in hospitality and tourism," *Int. J. Contemp. Hosp. Manag.*, vol. 28, no. 3, pp. 516–558, 2016, doi: 10.1108/IJCHM-10-2014-0510.
55. J. P. Robinson, P. R. Shaver, and L. S. Wrightsman, *Criteria for Scale Selection and Evaluation*, in *Measures of Personality and Social Psychological Attitudes*, pp. 1–16. Academic Press, 1991, doi: 10.1016/b978-0-12-590241-0.50005-8.
56. K. Nusair and N. Hua, "Comparative assessment of structural equation modeling and multiple regression research methodologies: E-commerce context," *Tourism Manag.*, vol. 31, no. 2, pp. 314–324, 2010, doi: 10.1016/j.tourman.2009.03.010.
57. J. Anderson and D. W. Gerbing, "Structural equation modeling in practice: A review and recommended two-step approach," *Psychol. Bull.*, vol. 103, no. 3, pp. 411, 1988, doi: 10.1037/0033-2909.103.3.411.
58. H. Baumgartner and C. Homburg, "Applications of structural equation modeling in marketing and consumer research: A review," *Int. J. Res. Mark.*, vol. 13, no. 2, pp. 139–161, 1996, doi: 10.1016/0167-8116(95)00038-0.
59. W. O. Bearden, S. Sharma, and J. E. Teel, "Sample size effects on chi square and other statistics used in evaluating causal models," *J. Mark. Res.*, vol. 19, no. 4, pp. 425–430, 1982, doi: 10.2307/3151716.
60. L. Hu and P. M. Bentler, "Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives," *Struct. Equ. Model.: A Multidiscip. J.*, vol. 6, no. 1, pp. 1–55, 1999, doi: 10.1080/10705519909540118.
61. O. Berezan, C. Raab, M. Yoo, and C. Love, "Sustainable hotel practices and nationality: The impact on guest satisfaction and guest intention to return," *Int. J. Hosp. Manag.*, vol. 33, pp. 292–300, 2013, doi: 10.1016/j.ijhm.2013.01.003.