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Extending the GSTC Criteria to Sustainable Hotel Perception to Predict Visit Intention

Gözdegül BAŞER[1]
Evla MUTLU[2]

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Abstract

This research explores Turkish visitors' perceptions of the "sustainable hotel" concept, its influence on their intention to stay at such hotels, and whether demographic differences affect these perceptions. GSTC criteria for sustainable hotels were utilized to assess the perceptions of hotel visitors in Türkiye. Data from 417 participants were analyzed to examine demographic differences and intentions to stay. The findings identified four main factors: Sustainable Management and Environmental Practices (SMEP), Regulatory Compliance and Social Responsibility (RCSR), Wildlife and Natural Area Conservation (WNAC), and Local Community and Economic Support (LCES). Overall, perception positively influences the intention to stay, with SMEP significantly affecting visit intention. The study found no differences in perceptions based on gender, age, and marital status, but differences were observed based on education, profession, and income. This study deepens the understanding of the "sustainable hotel" concept and provides valuable insights into future research.

Key Words: Sustainable Hotel, Sustainability, GSTC, Visitor Perception, Intention to Stay, Hospitality

JEL Code: Q56, L83, M31

1. Introduction

The United Nations defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" in 1987 (United Nations: Academic Impact, n.d.). Rising concerns about sustainability stem from global environmental challenges like climate change, population growth, and natural resource scarcity.

[1] Assoc. Prof., PhD, Antalya Bilim University, Türkiye, gozdegul.baser@antalya.edu.tr, https://orcid.org/0000-0002-1450-191X
[2] Assist Prof., PhD, Antalya Bilim University, Türkiye, evla.mutlu@antalya.edu.tr, https://orcid.org/0000-0001-9940-570X

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These issues are increasingly emphasized in global policy frameworks, including the UN's development agenda and the 2015 climate agreement (United Nations: Paris Agreement, 2015). Tourism accounts for roughly 8% of global carbon emissions, primarily due to air travel and resource-intensive activities, particularly within the hotel industry (Sustainable Travel International, n.d.; Manaktola & Jauhari, 2007).

Following the 2030 Agenda for Sustainable Development, the hotel industry is encouraged to prioritize reducing its carbon footprint while rehiring and retraining its workforce (United Nations: 2030 Agenda for Sustainable Development, n.d.). This necessitates addressing energy and water usage, food waste, and environmental degradation. Increasingly, hotels are adopting eco-friendly practices and innovative technologies to minimize environmental impact and enhance their green image (Chen, 2015). Sustainable hotels, which efficiently manage resources, are crucial in mitigating environmental impacts (Bohdanowicz et al., 2001; Chen, 2015). To ensure the long-term viability of tourism, embracing sustainability has become essential. Rather than focusing solely on environmental factors, sustainable tourism encompasses a broader perspective, integrating social, economic, cultural, and ecological dimensions (Koçoğlu et al., 2020). When hotels implement environmental and social sustainability practices, they often increase guest satisfaction (Berezan et al., 2013; Floričić, 2020; Soni et al., 2022; Yang et al., 2024).

As traveler preferences shift, hotel guests increasingly value a property's sustainability credentials. In response, many hotel operators are adopting environmentally and socially responsible practices to appeal to eco-conscious customers and investors and remain competitive and profitable (Bader, 2005). By 2023, nearly half of the hospitality businesses across Europe reported significant challenges in implementing sustainability and decarbonization strategies (Statista, n.d.). In line with these trends, sustainability has emerged as a key factor influencing hotel choice (Verma & Chandra, 2018). Hotels that adopt visible, responsible practices tend to experience improved financial performance, and evidence suggests that communicating these efforts enhances guest engagement and satisfaction (Acampora et al., 2022; Garanti et al., 2024). For this reason, green hotels should design strategies in a way that increases customers' awareness and concern towards environmental issues (Waris & Mohd Suki, 2025).

It is important to distinguish between sustainable, green, and eco-hotels. A sustainable hotel incorporates environmental, social, cultural, and economic aspects of sustainability, extending its focus beyond environmental impact to include support for local communities (Rainforest Alliance, 2023; Jurigova et al., 2016). Eco hotels are often situated in nature and are built to minimize environmental harm. These hotels aim to integrate low environmental impact and focus on conservation, benefiting environment-friendly energy sources and growing organic and local food (Dani et al., 2021). In comparison, green hotels emphasize day-to-day

practices such as recycling and efficient energy use (Millar & Baloğlu, 2008). While sustainability in hospitality is widely embraced, early researchers address the issue of guests' perception of eco-friendly implementations as a compromise on comfort, which in turn can affect their overall satisfaction during a hotel stay (Bohdanowicz et al., 2001; Placet et al., 2005). On the other hand, the increase in consumers' awareness towards environmentally friendly hotels may place less emphasis on comfort.

Tourist behavior and preferences for sustainable hotels can be considered hot subjects. For example, previous research has explored which sustainable practices are most attractive to tourists, how these practices influence satisfaction, and to what extent guests are willing to pay more (Han et al., 2009; Millar & Baloğlu, 2008; Floričić, 2020; Manaktola & Jauhari, 2007). Literature also reveals studies on how hotel managers perceive sustainability and how they align with Sustainable Development Goals (SDGs) (Abdou et al., 2020; Buffa et al., 2018).

Studies conducted in Türkiye show similarities with international literature. For instance, a study in Seferihisar has demonstrated that place identity can foster positive attitudes toward sustainable tourism (Buzlukçu, 2020). In the case of Antalya, findings reveal that guests often associate green-certified hotels with green practices such as energy conservation and locally produced food (Can et al., 2014). Studies conducted in Cappadocia and İzmir revealed the environmentally aware tourist profile in the region (Tektaş & Çamlıca, 2015; Yarımoğlu & Günay, 2020). Yıldız (2012) emphasized that when guests experience visible green practices, it not only enhances their satisfaction but may also increase their long-term loyalty to such accommodations.

Türkiye has taken a structured policy approach to embedding sustainability into tourism. Officially introduced in January 2023 and based on the GSTC's globally recognized standards, the Sustainable Tourism Türkiye Program requires all accommodation providers to comply with staged sustainability criteria (Türkiye Tourism Promotion and Development Agency, n.d.). What distinguishes Türkiye's approach is that it represents the first nationwide, mandatory alignment with the GSTC framework (GSTC, 2022).

The full implementation of GSTC, which will be by 2030, is expected to bring strategic advantages to the tourism industry worldwide. Aligning with GSTC will strengthen the hotels' image and position in international markets. According to Tüfek and Çalha (2024), Türkiye had issued a total of 1,832 sustainability-related certifications across various programs, with GSTC certification being the most widely adopted (1,584 hotels), followed by Green Key (126) and Travelife (85). Other certifications, such as Earth Check (1 hotel), Green Globe (8), and LEED (28), had lower representation, while Bio Hotels and TripAdvisor Green leaders were missing from the dataset.

On the other hand, while the global hospitality industry increasingly embraces eco-friendly measures, Tosun (2001) reveals that Turkish hotels may encounter unique obstacles.

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The researcher highlights several critical issues, including short-term economic gains that have led to rapid, uncontrolled tourism expansion, often disregarding environmental and cultural sustainability.

This study investigates tourists' perceptions of sustainable hotels in Türkiye by examining the influence of GSTC regulations on their intention to stay. While previous research has explored various aspects of sustainable practices in the hospitality industry, there is limited empirical evidence on the direct impact of certification awareness on consumer behavior in Turkey. By examining the influence of GSTC regulations on tourists' intentions to stay, this research provides valuable insights into the effectiveness of sustainability certifications in shaping guest preferences. Demographic characteristics serve as a valuable tool for understanding how tourists perceive sustainable hotels and the extent to which these perceptions influence their accommodation preferences. This study seeks to bridge the gap between tourist perceptions about sustainable hotels and their relevance to GSTC criteria by investigating sustainable hotels. The study aims to help researchers and practitioners improve sustainable practices and align them with guest expectations. It also encourages hoteliers to view sustainability as a strategic advantage.

This research is distinctive in its focus on how guests recognize sustainability certification, particularly the GSTC, and how this awareness affects their intention to stay. By exploring this link, the study offers insights into how certification works in Turkish hospitality and provides practical suggestions for improving sustainability communication and application.

2. Literature Review

Sustainable Hotels and Customer Perception

There has been a growing interest in sustainability of destinations, cities, tourism, and particularly in the hotel industry (Verma & Chandra, 2018; Fuchs et al., 2025). Although tourism is a primary source of income for some countries, it is also restricted in some instances due to the negative impacts of over-tourism. This conflict leads us to the importance of sustainable tourism. Sustainable practices mainly involve reducing environmental harm by addressing critical issues such as climate change, pollution, and regulatory compliance with environmental policies (Berezan et al., 2014; Chung, 2020; Han, 2020). Hotels play a crucial role in this transition as they can implement pollution control, waste reduction, energy conservation, and renewable energy sources as a part of their strategy (Chung & Parker, 2010; Pakdil & Kurtulmuşoğlu, 2017). Given that electricity represents 60–70% of a hotel's utility costs (Bruns-Smith et al., 2015), many hotels have adopted measures such as towel and linen reuse programs, low-flush toilets, energy-efficient lighting systems, and renewable energy integration (Nisa et al., 2017; Han et al., 2011), sourcing local materials, promoting recycling,

and offering environmental education to both staff and guests (Bader, 2005; Boronat-Navarro & Pérez-Aranda, 2019).

The implementation of these practices, however, varies widely across regions and comes with some debates. The differences in practices are related to the variety of local resources, architectural design, guest profiles, or level of commitment from hotel management (Bohdanowicz et al., 2001; Sloan et al., 2009). Hotels may offer different solutions to environmental concerns and must promote these practices to benefit the competition. Previous research shows that promoting a hotel's sustainable practices can raise guest awareness, build trust, and encourage eco-friendly behavior (Walsh & Dodds, 2017; Wang et al., 2019). However, some tourism practices have been criticized for greenwashing—where hotels promote sustainability mainly for financial gains (Aji & Sutikno, 2015; Yarimoglu & Günay, 2020). Another criticism concerns green certification and its effect on customer preferences (Patwary et al., 2023; Robin et al., 2016). In addition, hotel managers may hesitate to follow these practices due to concerns such as higher costs or a perceived loss of comfort (Baker et al., 2014; Yadav & Pathak, 2017).

The Global Sustainable Tourism Council (GSTC) developed a set of criteria and a framework for the travel and hospitality sectors (GSTC: About the Global Sustainable Tourism Council, n.d.) to set a common ground. The GSTC criteria was announced in 2010 and offers a set of standards for different organizations and cultures (GSTC: GSTC Criteria Overview, n.d.). These criteria are structured around four key themes: effective sustainability planning, maximizing benefits to local communities, preserving cultural heritage, and minimizing environmental impact (GSTC: GSTC Industry Criteria, 2016). Studies have compared sustainability standards (Bricker & Schultz, 2011), assessed readiness for implementation (Levy & Duverger, 2010), and evaluated hotels' adherence to GSTC standards through online reviews (Brazytė et al., 2017).

In Türkiye, sustainable hotels are gaining prominence, guided by initiatives from the Ministry of Culture and Tourism. The national certification system began in 1993 with the "Environment-Friendly Business" symbol, evolving into the "Green Star" certification in 2008 (The Ministry of Culture and Tourism of the Turkish Republic, n.d.). During the COVID-19 pandemic, Türkiye's Safe Tourism Certification Program integrated Green Tourism Certification, based on GSTC criteria, creating the Safe and Green Tourism Certification Program (Türkiye Tourism Promotion and Development Agency, n.d.). Since studies emphasize the impact of stakeholder, customer, and rival pressure on adapting to sustainable practices (Xie et al., 2024), the government's pressure can be recognized as a positive approach.

Many studies have explored how sustainability influences hotel visitor perception, satisfaction, and intention to stay. Customers are more likely to stay in green hotels if they have a positive attitude towards sustainability and see that others (friends and society) support eco-friendly choices (Han et al., 2010). However, greenwashing (false sustainability claims) can

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harm customer perception, although a strong green image boosts trust and loyalty (Lee et al., 2010). Guests are more likely to book a green hotel if they feel a moral obligation to support sustainability and believe their choices make a difference (Chen & Tung, 2014). Also, eco-friendly initiatives increase customer satisfaction only if they do not reduce comfort or convenience (Gao et al., 2016). Similarly, guests will choose green hotels if they see benefits (cost savings, better experience), but they will avoid them if they perceive higher costs or lower service quality (Xu et al., 2020). Benefits, such as financial and tangible costs, demonstrated a significant connection to visit intention of Northern Cyprus (Demir et al., 2021). Additionally, environmental concern positively affected the perception of green benefits, while functional and emotional advantages and costs were significantly linked to purchase intention (Jiang & Kim, 2015).

Kokkhangplu et al. (2023) empirically examined how tourists' perceptions of eco-friendly value influence their satisfaction and intention to return to sustainable hotels in Thailand. The study found that tourist satisfaction partially mediates this relationship, suggesting that positive experiences at eco-friendly hotels increase the likelihood of return visits. Monitoring the changes in guest expectations and designing the strategy accordingly is essential for the hospitality industry (Zeithaml, 1988).

This study adopts the Theory of Green Purchase Behavior (TGPB) to reveal visitors' decision-making process (Han et al., 2010; Paul et al., 2016). Developed from the Theory of Planned Behavior (TPB) and improved by Ajzen (1991), TGPB offers a foundation for examining consumers' preferences for environmentally responsible products and services. The theory proposes that green purchasing behavior results from psychological and behavioral influences. One of the leading suggestions of TGPB is that individuals with high awareness and responsibility for environmental issues are more likely to be customers of eco-friendly hotels (Han et al., 2010). TGPB posits that individuals' environmentally responsible behaviors are influenced by a combination of personal and social factors (Han, 2020). Specifically, it identifies key antecedents such as attitude, ascribed responsibility, and social norms, which directly activate personal norms. These activators are shaped by underlying constructs including awareness of consequences, ecological worldview, environmental values, and image. Additionally, past behavior serves as a significant predictor of future green purchase actions. In the context of this study, TGPB provides a robust framework for understanding how tourists' environmental attitudes and perceptions influence their intentions to choose green-certified hotels. By applying TGPB, this research aims to uncover the psychological and behavioral mechanisms that drive sustainable lodging choices, thereby contributing to the development of targeted strategies for promoting eco-friendly tourism practices.

Hypothesis Development

As supported by gender socialization theory, studies show that women are generally more environmentally conscious than men and participate in more environmentally friendly practices (Wang et al., 2018; Nadeem et al., 2020). However, some researchers suggest that gender may not significantly affect environmental concerns (Sevilla-Sevilla et al., 2019; Jain et al., 2024). Studies from Türkiye also show that factors such as income and gender affect the environmental attitudes of guests (Kılınç et al., 2020; Güneş et al., 2020). Accordingly, gender is a factor that should be evaluated in this study, as in H1a.

H1a: There is a significant difference in sustainable hotel perception between genders.

Age is the second demographic that can influence attitudes toward sustainable tourism. As noted by Yadav and Pathak (2016), younger tourists seem more interested in incorporating sustainability in their travel plans, while older consumers seem not to care as much compared to younger ones (Wright et al., 2003). Also, students who are taught about sustainability tend to possess a stronger awareness of the impact of their purchasing decisions and are more willing to select eco-friendly options (Boca & Saraçlı, 2019). On the other hand, Diamantopoulos et al. (2013) argue that some level of environmental concern seems to exist regardless of age. However, younger and older people are equally hesitant to give up comfort and convenience. Hence, effect of age groups is considered in H1b;

H1b: There is a significant difference in sustainable hotel perception between age groups.

Marital status has also been linked to high environmental concerns since married couples are often motivated by a desire to ensure the long-term well-being of their family (Diamantopoulos et al., 2003). H1c is aimed at understanding the significance of marital status.

H1c: There is a significant difference in sustainable hotel perception between marital status groups.

Higher-income individuals are accepted to have greater access to information about ecological issues and have the financial means to adopt sustainable practices (Klineberg et al., 1998). However, some studies claim no significant relationship between income and willingness to pay for eco-hotels (Boronat-Navarro & Pérez-Aranda, 2020; Han et al., 2011). Accordingly, income level is recognized to impact environmentally friendly purchase behavior, which is indicated in H1d;

H1d: There is a significant difference in sustainable hotel perception between income levels.

Education has been associated with increased environmental awareness and pro-environmental behavior such as recycling. Individuals with higher levels of education are more informed about sustainability issues (Fransson & Gärling, 1999). Accordingly, studies focus on

environmental education, for instance, geography, specifically to raise awareness in early ages (Rakuasa & Latue, 2023). H1e is established to understand this effect.

H1e: There is a significant difference in sustainable hotel perception between education levels.

Finally, the profession is another demographic factor that can shape individuals' environmental attitudes. Those working in environmentally focused or scientific sectors may be more inclined toward sustainability than individuals in unrelated fields (Diamantopoulos et al., 2003). Previous experience in environmentally friendly hotels can also influence guests' perceptions and expectations. Guests with eco-friendly hotel experiences may have increased awareness, resulting in an increased willingness to pay again (Boronat-Navarro and Pérez—Aranda, 2020). Accordingly, H1f is proposed to reveal significance of profession.

H1f: There is a significant difference in sustainable hotel perception between professions.

When visitors perceive a hotel as genuinely committed to environmental responsibility, this perception can result in trust, satisfaction, and a stronger sense of loyalty, increasing the likelihood of staying (Han et al., 2010; Lee et al., 2010). Researchers (Xu et al., 2020; Waris & Mohd Suki, 2025) also highlight that a communicated green image can have a positive impact if it matches the guests' expectations. Similarly, guests who believe in the benefits of sustainability are more likely to prefer eco-friendly hotels (Cheng & Tung, 2014; Gupta et al., 2023). Moreover, tourists' trust and personal values influence their intention to stay at green hotels, and perceived value links their beliefs with this intention (Fauzi et al., 2024). Therefore, hypothesis 2 is proposed as.

H2: Tourist's overall perception of hotel sustainability positively influences visit intention.

3. Methodology

This study was designed as a qualitative framework due to the defined structure of the GSTC criteria, which were converted into a 5-point Likert scale. The survey targeted adults aged 18 and over, selected randomly to ensure diversity. Questions measured: awareness of sustainability certifications, perceptions of green practices, and willingness to stay in GSCT-certified hotels in Türkiye. Participation was voluntary, and consent was obtained at the beginning of the questionnaire to assure anonymity. The data were analyzed using descriptive and inferential methods to explore how both sustainability perception and demographics influence visit intention and how demographics relate to sustainability perception.

Research Design

Each of the 42 GSTC indicators was adapted into individual survey items to explore how Turkish tourists perceive sustainable hotels. The English version of the GSTC standards was used (https://www.gstc.org/gstc-criteria/gstc-industry-criteria-for-hotels/). Items were translated and checked by 3 experts. Participants were asked to rate their most recent hotel experience using a 5-point Likert scale. All GSTC criteria were included in the questionnaire, regardless of their position within the framework's hierarchy. To ensure both conceptual clarity and accurate translation, the items were reviewed by three academics with expertise in sustainable tourism. Their evaluations were favorable, no revisions were deemed necessary, accordingly no pilot study was carried out. Similar applications of GSTC criteria in previous research lend further validity to this approach (Alipour et al., 2019; Brazytė et al., 2017; De Villa & City, n.d.; Levy & Duverger, 2010; Treepong & Buatham, 2023).

Data Collection and Descriptive Statistics

This study used a purposive sampling approach to ensure demographic diversity across gender, age, education, and income. While the sampling was non-probabilistic, care was taken to avoid over-representation of any single group. The survey was distributed via online channels including social media and email, and participation was voluntary. To ensure diversity across demographic characteristics, a purposive sampling approach was used with an aim to reflect varied gender, age, education, income, and professional profiles (see Table 1).

The survey was administered online to 419 Turkish citizens aged 18 or older. Only the people who stayed in a hotel in the past 1 year and were aged 18 or older answered the questionnaire. Two responses were deleted because of high missing values. The data were analyzed using SPSS 29 and Python—Jupyter Notebook.

The descriptive statistics of the study reveal significant insights into the demographics of respondents. Most respondents are female, 56.4%, with males representing 43.6%. Age distribution shows a substantial representation of young adults and middle-aged individuals, with 21.7% aged 18-25, 24.9% aged 26-35, 15.6% aged 36-45, 15.6% aged 46-54, and 11.6% aged 55 and above. Marital status indicates that 54.4% are married, while 45.6% are single. Income levels vary, with 17.0% earning below 8500 TL, 24.5% earning between 8501 TL - 15,000 TL, 26.6% earning between 15,001 TL - 20,000 TL, and 24.5% earning above 20,001 TL. Although these values may seem low by current standards (due to high inflation rates), they were chosen to accurately capture the socio-economic diversity of respondents at the time of survey application. This approach ensures that the analysis remains relevant and provides valuable insights into how perceptions of sustainable hotels vary across different income groups.

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Educational attainment is diverse, with 6.5% having primary education, 18.7% high school, 17.3% associate degree, 37.5% bachelor's degree, and 20.1% with a master's or Ph.D. Professional distribution includes 18.2% state officers, 31.4% private sector employees, 14.6% self-employed, and 18.9% students. Additionally, 32.3% of respondents have experienced staying in a sustainable hotel, while 67.6% have not. These demographics highlight the engagement levels across different segments and support stratified sampling (Table 1). 67.6% of the respondents had no previous experience of accommodating in a sustainable hotel. However, 66.3% stated that they would pay attention to the sustainable qualifications of the hotel.

Table 1. Demographics of participants

Qualification	**Freq.**	**Percent**
Gender		
Female	Female	Female
Male	Male	Male
Age		
18-25	100	24
26-35	103	24.7
36-45	104	24.9
46-54	65	15.6
55 and above	45	10.8
Marital Status		
Married	227	54.4
Bachelor	190	45.6
Income Level		
8500 TL and below	71	17.0
8501 TL - 15.000 TL	102	24.5
15.001 TL - 20.000 TL	136	32.6
20.001 TL and above	106	24.5
Education		
Primary School	27	6.5
High School	18	18.7
Associate degree	55	13.2
Bachelor's degree	198	47.5
Masters/PhD	58	13.9
Profession		
State Officer	76	18.2

Private Sector	131	31.4
Self-Employed	61	14.6
Student	79	18.9
Retired	40	9.6
Unemployed	30	7.2
Accommodation Experience in Sustainable Hotel		
Yes	133	31.9
No	282	67.6

Source: Authors' calculations

4. Findings

Reliability and Validity

Internal consistency was confirmed by Cronbach's alpha values, all of which surpassed the 0.7 threshold, indicating reliable measurement across scale items. The overall Cronbach's alpha for this study is 0.819, confirming that the scale is reliable. As shown in Table 2, the Cronbach's alpha for each latent variable exceeds 0.7. To analyze the scale's structural validity, the KMO test was conducted, showing that each potential variable had a KMO value above the minimum standard of 0.5 (Table 2), with an overall KMO value of 0.958. This indicates that the data are suitable for factor analysis.

Finally, the reliability of the scale's 42 measurement items was assessed. Each item's corrected item-total correlation exceeded 0.4, demonstrating a strong association between individual items and the overall scale measurement. Thus, the scale's validity was ensured.

Table 2. Descriptive Statistics of Items

Item	Mean	Standard Deviation	Cronbach's Alpha	Skewness	Kurtosis
A1	3.580	1.042	0.965	-0.374	-0.783
A2	4.007	0.792	0.966	-0.883	1.419
A3	3.549	1.130	0.965	-0.362	-0.903
A4	3.817	0.871	0.966	-0.706	0.582
A5	4.139	0.790	0.966	-0.925	1.119
A6	3.654	0.998	0.965	-0.413	-0.530
A7	3.475	1.089	0.965	-0.389	-0.628
A7.1	4.058	0.629	0.966	-0.639	2.319
A7.2	4.214	0.553	0.966	-0.744	2.773
A7.3	3.411	0.903	0.965	0.041	-0.605

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A7.4	3.984	0.558	0.966	0.308	0.379
A8	3.904	0.791	0.966	-0.699	0.997
A9	4.045	0.846	0.966	-0.896	0.830
A10	3.535	0.983	0.965	-0.165	-0.806
B1	3.761	0.691	0.966	0.125	0.186
B2	3.669	0.917	0.966	-0.440	0.055
B3	3.732	0.823	0.966	-0.167	-0.279
B4	3.712	0.819	0.966	-0.135	-0.283
B5	3.983	0.853	0.966	-1.060	2.055
B6	4.040	0.788	0.966	-1.044	2.040
B7	4.007	0.767	0.966	-1.097	2.574
B8	4.000	0.700	0.966	-0.967	2.531
C1	4.021	0.745	0.966	-0.731	1.139
C2	4.014	0.793	0.966	-0.661	0.535
C3	3.947	0.773	0.966	-0.658	0.738
C4	4.119	0.700	0.966	-0.631	1.163
D1.1	3.566	1.034	0.965	-0.196	-0.962
D1.2	3.451	1.228	0.965	-0.229	-1.223
D1.3	3.501	1.160	0.965	-0.243	-1.131
D1.4	3.393	1.351	0.965	-0.288	-1.223
D2.1	3.340	1.109	0.965	0.009	-1.070
D2.2	3.357	1.092	0.965	-0.054	-0.984
D2.3	3.374	1.184	0.965	-0.112	-1.155
D2.4	3.430	1.187	0.965	-0.188	-1.184
D2.5	3.413	1.125	0.965	-0.162	-1.088
D2.6	3.489	1.158	0.965	-0.287	-1.069
D3.1	3.443	1.021	0.965	-0.197	-0.577
D3.2	3.589	0.944	0.965	-0.354	-0.357
D3.3	4.069	0.801	0.966	-0.603	0.072
D3.4	3.796	0.799	0.966	-0.523	0.577
5	3.640	0.849	0.966	-0.184	-0.227
6	3.846	0.821	0.966	-0.572	0.514

Source: Authors' calculations

Factor Analysis

To uncover underlying dimensions, exploratory factor analysis was applied to the 43-item GSTC-based questionnaire using maximum likelihood extraction and oblique rotation, allowing for factor intercorrelation. Principal Component Analysis (PCA), which is carried out by SPSS 29, is used, and due to the extraction value being below 0.5 in the communalities table, the questions coded A4, A5, A72, A74, B5, and C4 were removed from the model. With the remaining variables, questions were distributed into four factors using Varimax rotation with Kaiser normalization, achieving 63.994% explanatory power. Considering the Kaiser-Meyer-Olkin (0.958) and Bartlett's (sig.<0.001) values, both measures indicate that the data matrix possesses adequate correlations, thereby validating the application of PCA.

The resulting factor groups were named Sustainable Management and Environmental Practices (SMEP), Regulatory Compliance and Social Responsibility (RCSR), Wildlife and Natural Area Conservation (WNAC), and Local Community and Economic Support (LCES). SMEP was highly similar to GSTC's "effective sustainability planning" dimension, LCES to GSTC's "maximizing social and economic benefits for the local community," RCSR to GSTC's "enhancing cultural heritage", and WNAC to GSTC's "reducing negative impacts to the environment" dimension.

Each latent variable had a Cronbach's alpha greater than 0.7 (SMEP; p=0.974, RCSR; p=0.912, WNAC; p=0.874, LCES; p=0.890). The pairwise correlations among SMEP, RCSR, WNAC, and LCES were positive and moderately firm, ranging from 0.520 to 0.581.

In addition to the exploratory factor analysis (EFA) used to identify the underlying factor structure, confirmatory factor analysis (CFA) was conducted to validate the four-factor measurement model via Python Library Semopy. The model demonstrated acceptable fit: CFI = 0.87, TLI = 0.86, GFI = 0.83, AGFI = 0.82, and RMSEA = 0.084. While some indices fell slightly below the ideal thresholds, the overall fit was within acceptable limits, supporting the validity of the factor structure.

Non-Parametric Tests

Normality tests were carried out to search for significant differences between factors and demographic characteristics. According to the Kolmogorov-Smirnov and Shapiro-Wilk test, the independent variables of the GSTC scale, the factor scores, and the intention variables did not support the standard distribution assumption. In order to normalize the data, several techniques were tested, such as logarithmic transformation, square root transformation, and Z scores on SPSS, besides Box-Cox and Yeo-Johnson transformations on Python (scipy.stats library). Since these techniques did not achieve normalization, non-parametric tests were preferred. For the binary variables such as marital status, gender, and experience, the Mann-Whitney U test was conducted. For education, age, income level, and profession, which are

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multi-categorical variables, the Kruskal-Wallis test was used. All non-parametric tests were carried out in Python; sample codes are shared in Appendix 2.

The results show no significant difference between the factor groups and gender since p values are greater than 0.05 for sum scores (0.965, 0.558, 0.405, and 0.779, respectively). Accordingly, Hypothesis 1a is rejected for all factors.

For age groups, sum scores (p values 0.809, 0.219, 0.092, and 0.775, respectively) with the age variable indicate statistically not significant relations. Based on the results, Hypothesis 1b is rejected for all factors. For marital status, the p-values for all factors are greater than 0.05, meaning there are no statistically significant differences among different marital status groups. Based on the results, Hypothesis 1c is rejected for all factors. For income level, specifically, the SMEP, WNAC, and LCES sum scores (p values 0.017, 0.003, and 0.000, respectively) show significant differences based on income level. Based on the results, Hypothesis 1d is rejected for RCSR and accepted for SMEP, WNAC, and LCES. For education level, sum scores (p values 0.035 and 0.039 respectively) of SMEP and RCSR indicate significant differences. Accordingly, Hypothesis 1e is rejected for WNAC, and LCES and accepted for SMEP and RCSR factors

For profession, based on the sum scores, SMEP and WNAC (p values 0.001 and 0.046, respectively) show significant differences. Accordingly, Hypothesis 1f is rejected for RCSR and LCES and accepted for SMEP and WNAC factors. Finally, for the previous sustainable hotel experience of tourists, the results indicate that experience significantly impacts all of the sum scores of all factor groups (p values <0.000). Accordingly, Hypothesis 1g is accepted for SMEP, RCSR, WNAC, and LCES.

Consequently, hypotheses 1a, 1b, and 1 c are rejected, whereas hypothesis 1d is rejected except for SMEP, WNAC, and LCES; hypothesis 1e is rejected except for SMEP and RCSR; hypothesis 1f is rejected except for SMEP and WNAC, and hypothesis 1g is supported for all factor groups.

Table 3. Results of Hypothesis Testing per Factor Groups

Hypothesis	p values for factor groups			
	SMEP	RCSR	WNAC	LCES
1a: There is a significant difference in sustainable hotel perception between genders.	0.965	0.558	0.405	0.779
1b: There is a significant difference in sustainable hotel perception between age	0.809	0.219	0.092	0.775

groups.				
1c: There is a significant difference in sustainable hotel perception between marital statuses.	0.172	0.256	0.450	0.875
1d: There is a significant difference in sustainable hotel perception between income levels.	0.017	0.402	0.003	6.391
1e: There is a significant difference in sustainable hotel perception between education levels.	0.035	0.039	0.152	0.159
1f: There is a significant difference in sustainable hotel perception between professions.	0.001	0.309	0.046	0.698
1g: There is a significant difference in sustainable hotel perception for visitors with prior experience.	8.885	9.689	2.00	1.865
2: Tourist's overall perception on hotel sustainability has a positive influence on visit intention.	0.000	0.625	0.543	0.721
	Correlation (r value)			
	0.542	0.377	0.329	lowest

Source: Authors' calculations

Regression Analysis

For testing Hypothesis 2, overall perception was calculated as the sum score of latent factor groups (Table 4). Overall perception's Kolmogorov-Smirnov test statistic was 0.046, and the p-value was 0.326. The regression analysis showed that Overall Perception was a significant predictor of Visit Intention ($\beta = 0.755$, $p < 0.001$), demonstrating a strong positive association between the two variables. The model accounted for approximately 15.8% of the variance in visit intention, emphasizing the role of sustainability perceptions in shaping tourist behavior.

Table 4. Regression Analysis Results

Variable	Coefficient (β)	Std. Error	t	p-value	95% CI Lower	95% CI Upper
Constant	1.2267	0.324	3.783	0.000	0.589	1.864
Overall_Perception	0.7553	0.086	8.832	0.000	0.587	0.923
Model Summary						
Statistic	Value					
R-squared	0.158					

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Variable	Coefficient (β)	Std. Error	t	p-value	95% CI Lower	95% CI Upper
Adjusted R-squared	0.156					
F-statistic	78.01					
Prob (F-statistic)	2.92e-17					
Observations (N)	417					
AIC	1213					
BIC	1222					
Durbin-Watson	1.736					

Source: Authors' calculations

When we analyze the effect of sustainable hotel latent factors on intention to visit, WNAC and LCES have an adverse effect, and SMEP and RCSR positively affect intention to visit. SMEP has the highest correlation with intention of staying (0.542). This shows that visitors pay attention to the hotels' sustainable management and environmental practices. RCSR (0.377) and WNAC (0.329) have scores that are close to each other. LCES has the lowest score for intention to stay, which means that local community activities and economic sustainability factors do not have a prevalent impact on intention to stay. Consequently, Hypothesis 2 is supported.

5. Conclusion

This study utilized the GSTC criteria to assess Turkish visitors' perceptions of sustainable hotels and examined their influence on the intention to stay in such accommodations. To measure sustainable hotel perception, the GTSC sustainable hotel evaluation criteria were adapted into a survey to be filled out by tourists. In this survey, four factors were identified: Sustainable Management and Environmental Practices (SMEP), Regulatory Compliance and Social Responsibility (RCSR), Wildlife and Natural Area Conservation (WNAC), and Local Community and Economic Support (LCES). These factors comply with GSTC's central themes, including "sustainability planning," "maximizing community benefits," "enhancing cultural heritage," and "minimizing environmental impacts."

Although earlier studies have suggested that women tend to be more environmentally conscious and are often more willing to pay extra for eco-friendly products (Banerjee & McKeage, 1994; McIntyre et al., 1993; Wang et al., 2020), the present study did not observe any significant gender-based differences in perceptions of sustainable hotels—echoing the findings of Chikita (2012).

No notable differences were found across age groups regarding perceptions of sustainable accommodations. This aligns with Diamantopoulos et al. (2013), who argue that younger and older travelers may both express concern for the environment but are not necessarily inclined to compromise on comfort. Supporting this, Han et al. (2011) also reported no significant variations in eco-intention based on age categories.

Similarly, marital status was found to have no significant difference in sustainable hotel perception. However, some studies suggest that the number of children may positively affect environmental concerns due to considerations for their family's well-being (Diamantopoulos et al., 2003).

Income level shows different results for different dimensions of sustainable hotel perception. There is a significant difference in sustainable hotel perception for visitors related to dimensions like SMEP, WNAC, and LCES, whereas there is no significant difference for RCSR. This finding may reveal that income level can significantly affect sustainable hotel perception. Environmentally friendly hotels may be perceived as being more expensive than regular hotels. The results offer partial support for the conclusions of Klineberg et al. (1998), who argue that individuals with higher income levels are often more exposed to environmental information and can afford to adopt eco-friendly behaviors. This difference may also help explain why some studies have reported no significant association between income and the willingness to pay for sustainable hotels (Boronat-Navarro & Pérez-Aranda, 2020; Han et al., 2011). The educational background of the respondents revealed differences in factor groups. Significant differences were observed for WNAC and LCES, while SMEP and RCSR showed no significant difference. This may be due to a lower awareness of WNAC and LCES factors in society. When compared to previous studies, researchers emphasize the link between higher education and environmental awareness (Fransson & Gärling, 1999; Han et al., 2011), though this connection has not always been consistent (Fuentes-Moraleda et al., 2019), such as our results reveal a partial link.

Moreover, the profession of respondents influences perceptions about sustainable hotels, as suggested by previous research. The findings partially support Diamantopoulos et al. (2003), who suggest that individuals employed in professions with direct exposure to environmental hazards tend to exhibit greater environmental awareness. SMEP and WNAC are more significant, whereas RCSR and LCES are less significant for some professions.

Guests' intentions to visit a sustainable hotel were influenced by their previous stay in green hotels. This influence is also suggested in the literature, as previous experience increases guests' awareness and willingness to pay for sustainable practices (Han et al., 2011; Boronat-Navarro & Pérez-Aranda, 2020). All factor groups reveal the significant effect of previous visits. However, SMEP had the most substantial positive influence on the intention to stay, followed by RCSR, while WNAC and LCES had a negative impact. This finding suggests that visitors are more aware of sustainable management practices and regulatory compliance than

efforts related to wildlife conservation and local community support. LCES demonstrated the weakest correlation, suggesting that social and economic sustainability efforts are either less visible or less understood by guests. In contrast, SMEP emerged as the most recognized and valued dimension, indicating that guests are more responsive to environmental efforts that are clearly presented and consistently implemented.

Considering the results from the Theory of Green Purchase Behavior (TGPB) perspective, our findings indicate that Turkish tourists who place greater value on sustainable management practices are more inclined to choose sustainable hotels just as some other nationalities (Fuchs et al, 2025). On the contrary, negative associations were observed with WNAC and LCES. This contradiction suggests that WNAC and LCES are perceived as less influential. This may reflect a belief among guests that their individual decisions have a limited effect on broader ecological or social issues.

By applying TGPB, this study contributes to a better understanding of the factors influencing sustainable hotel preferences in Türkiye. The findings underline the importance of consumer trust, perceived impact, and awareness in motivating green choices (Casais & Ferreira, 2023). Previous research in Türkiye claims that certified hotels in Türkiye fail to share their sustainability practices on their websites, harming green trust (Hazarhun et al., 2023; Buluk Eşitti & Bay, 2023). Therefore, hotel managers and policymakers should enhance the clarity of sustainability messaging, promote meaningful guest engagement, and ensure greater visibility and credibility of green certifications.

All hotels are expected to align with GSTC standards by 2030 at the national level. This mandatory adaptation may strengthen sustainability practices and support hotels strategically. On the other hand, our findings suggest that many Turkish tourists may still lack awareness regarding sustainability's social and economic dimensions. Regional studies in areas such as Seferihisar, Antalya, Cappadocia, and İzmir have shown that place identity and cultural attachment significantly influence sustainability-related attitudes (Buzlukçu, 2020; Tektaş & Çamlıca, 2015). Despite this, aspects of sustainable transportation and community-oriented initiatives remain underdeveloped in Türkiye (Can et al., 2014).

One of the key points in promoting sustainable tourism is balancing eco-friendly hotels with guests' expectations for comfort and luxury. While Turkish tourists generally hold favorable views toward sustainability, their satisfaction still depends on aligning environmental efforts with service quality. Research emphasizes that hotels need to implement green practices holistically and there is still need for encouraging the implementation of sustainable tourism and tourism planning and disseminating the best practice from the destination level to the regional scale (Godovykh et al., 2024). There should be continuous awareness and strengthening of training of the employees about green practices' implementation, together with

government involvement in all matters concerning enforcement of green practices. Additionally, Karaçor and Tanrısever (2020) note that hotel managers in Türkiye acknowledge the positive contribution of certification to brand image, promotional efforts, and marketing performance.

Despite these positive developments, several structural challenges remain. As noted by Tosun (2001), short-term economic priorities and the over-commercialization of tourism continue to pose significant obstacles to achieving long-term sustainable development in the sector. While the global hospitality industry increasingly embraces eco-friendly practices, overcoming these problems is essential for Türkiye's transition to the GSTC-certified system. Tourism companies that fail to incorporate environmental practices into their strategies will risk their long-term viability (Hassan, 2000).

Hotels in Türkiye can prosper by integrating environmental, social, and economic sustainability while preserving the country's rich natural and cultural heritage. Promoting certifications like GSTC through marketing channels can attract eco-conscious travelers and differentiate them from competitors. Sustainability should be embedded in the core business strategy to ensure long-term success. Managers can achieve this by developing a sustainability roadmap that outlines clear goals, timelines, and responsibilities. Offering incentives for guests who actively engage in sustainable practices, such as discounts or loyalty points, can further promote eco-friendly behavior. These findings provide essential insights into Turkish visitors' perceptions of sustainable hotels, offering guidance to stakeholders on developing more effective sustainability strategies.

This study contributes to filling research gaps in tourist sustainable hotel perception and intention to stay in such hotels. However, this study has several limitations. First, it covers a particular territory (Türkiye); such research should be done in other contexts where hotel operators follow GSTC criteria. Second, tourist perception may change over time. Therefore, such research can be repeated at some defined intervals to find out the change in tourists' perception.

Institutional Review Board Statement: The study's compliance with ethical standards was reviewed and approved by the ethics committee affiliated with the institution where the authors worked, with letter number 2300002678, on 23.02.2023.

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