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Beyond Self-Reports: Using Eye-Tracking to Explore Consumer Decision-Making in Green Hotels[1]

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Abstract
This study examines the subconscious drivers of consumer decision-making in the context of hotel attributes (e.g., green facilities, price, familiar brand, and location), employing neuromarketing (eye-tracking) technology to transcend traditional self-reported methods. A laboratory experiment involving 30 participants to examine the fixation of eye movements (attention) across multiple hotel attributes, including price, brand familiarity, location, and green facilities. The Stimulus–Organism–Response (S-O-R) model provided the theoretical foundation for linking external stimuli with subconscious cognitive responses. The findings revealed significant differences in how participants engaged with different amenities. Green facilities, familiar brands, and pricing emerged as critical factors, with green facilities receiving significantly longer fixation durations, indicating strong interest and attracting more attention from participants. These findings suggest that incorporating sustainable practices attracts more consumer attention and enhances overall hotel perception, positively influencing decision-making. The study emphasizes the significance of sustainability in the hospitality and tourism industry and suggests that neuromarketing can reveal previously unexplored drivers of consumer behavior. This study makes two main contributions. Theoretically, it extends the S-O-R model by integrating neuromarketing evidence, showing how subconscious attentional processes shape consumer choices. Practically, it provides actionable strategies for hotel managers and policymakers to enhance the visibility, credibility, and appeal of green initiatives, with lessons applicable not only in Malaysia but also in other emerging tourism markets.

Keywords: green hotels, green facilities, eye tracking, stimulus-organism-response model, staying decision, neuromarketing

JEL Classification: Z30, Z32, Z39

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1. Introduction

Situated in the heart of Southeast Asia, Malaysia boasts a tropical climate and stunning landscapes, making it a sought-after destination for travellers. Malaysia (2025) reported that 12.9 million tourists had

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been recorded until June 2025, with expectations of further growth by year-end. In 2024, it highlighted that Malaysia's appeal as the premier destination in the region has been remarkable, with a notable 25 million international tourists. In 2023, the number of tourists was 20.141 million international tourists, while this number has dropped to 10. 070 million in 2022, based on the COVID-19 pandemic and lockdown almost everywhere, but this number was 26.100 million in 2019, before the COVID-19 pandemic. This significant tourist influx highlights Malaysia's role in global tourism; however, focusing solely on Malaysia limits the broader international applicability of sustainable tourism insights, necessitating a comparative analysis with global trends to enhance the study's relevance (UNWTO, 2023). Tourism remains Malaysia's second-largest economic driver, following the industrial sector (Ahn & Kwon, 2020). However, the environmental impact of this high tourist volume, particularly from the hotel industry, raises concerns. Hotels contribute to noise, carbon dioxide emissions, waste, exacerbating water pollution, and energy pollution (Aripin et al., 2018).

Globally, environmental concerns within the hotel industry have garnered global attention, prompting initiatives aimed at sustainable practices (Ahmed et al., 2023a). Over recent decades, the United Nations (UN) has expressed apprehension regarding environmental protection (UNEP, 2022). While Malaysia provides a valuable context as an emerging tourism market, the findings have broader significance for other developing and developed destinations facing similar sustainability challenges (Ferreira et al., 2025; Qamruzzaman, 2023). This framing allows the study to contribute not only to the Malaysian context but also to the international discourse on green hospitality (Qamruzzaman, 2023). The hotel sector is increasingly promoting eco-friendly practices to reduce its significant resource consumption and mitigate its environmental impact (Deraman et al., 2017). While Malaysia initiated green initiatives years ago, heightened awareness emerged following the 1997 economic crisis (Kasayanond et al., 2019). The government incorporated environmental concepts and policies into the Malaysia Plan, particularly within the tourism sector. In Malaysia, hotels have progressively adopted and implemented green practices, guided by management objectives, cost considerations, local context, and property size (Yusof & Jamaludin, 2013). However, the rationale for focusing on consumer "choice" in green hotels, as opposed to broader pro-environmental behaviors, remains unclear, requiring clarification on why this specific aspect is critical to sustainable tourism (Han et al., 2020; Verma & Chandra, 2018). This need for adaptive responses is consistent with broader economic evidence showing that sustained competitiveness increasingly depends on continuous innovation and strategic flexibility (Vlach et al., 2025).

As competition within the hotel industry intensifies, a pressing need arises to comprehend consumer behavior, particularly within green hotels (Ferreira et al., 2025; Szczepańska-Woszczyna et al., 2024). Decision-making behaviour at the managerial level is a key determinant of successful sustainability implementation and organizational outcomes (Moravec, 2023). Previous research has explicitly explored hotel choice as the key outcome, as it reflects the actual translation of pro-environmental attitudes into behavior (Matiza & Slabbert, 2025; Trinh & Thuy, 2024). While much of the sustainable tourism literature focuses on attitudes and intentions, fewer studies examine the point at which consumers make staying decisions, which is where subconscious drivers become most influential (Gianluigi Serio et al., 2025). Morrison (2022) emphasized that consumer behavior, including choices, usage, and post-purchase actions, is significantly influenced by personal variables, reflecting psychological attributes and perceptions. Consumers may interpret stimuli differently due to sensory differences in taste, touch, smell, hearing, and sight (Batat, 2024). Ferreira et al. (2025); Trinh & Thuy (2024) suggest that green hotel features and amenities, including toiletries, complimentary services, pool facilities, lounges, restaurants, and room policies, significantly impact consumer perceptions.

Understanding consumers' subconscious is paramount in this research, as it directly shapes their actual behaviors, underscoring the necessity of integrating neuromarketing methodologies into this study (Ahmed et al., 2022; Alsharif et al., 2022; Wang et al., 2024). According to Alsharif et al. (2023); Alsharif et al. (2025), neuromarketing is defined as an emerging multidisciplinary field that unravels how the human brain functions to address marketing-related inquiries. Neuromarketing measures responses to marketing stimuli by monitoring brain activity regions (Singh, 2020), showcasing significant potential

across diverse research domains. Despite being new and delivering relatively few results, it already demonstrates great promise in interacting with various research topics. By leveraging neuroscience and its methodologies for marketing studies, neuromarketing offers fresh insights into long-standing concepts and sheds light on previously enigmatic psychological and neurophysiological phenomena (Ahmed et al., 2023c; Alsharif et al., 2024).

Neuromarketing offers insights into consumer behavior and subconscious decision-making, using eye-tracking to measure brain activity and assess attention, making it a valuable tool for eliciting responses (Ahmed et al., 2024; Ahmed et al., 2025; Alsharif et al., 2024). Changes in pupil dilation indicate what captures attention, making eye-tracking a vital tool for assessing significance and eliciting responses. Ahmed et al. (2023b) illustrated that eye-tracking provides precise data, useful in marketing, by tracking gaze fixation, dwell time, eye movements, blink frequency, and pupil dilation. Applications include online usability testing, concept validation, packaging design, and advertisement evaluation (Grigaliūnaitė & Pilelienė, 2017; Pilelienė et al., 2022; Pilelienė & Grigaliūnaitė, 2016). Neuromarketing fundamentally leverages neuroscience to better understand consumer behavior and assess the effectiveness of marketing strategies based on subconscious responses, including cognitive and emotional ones (Ahmed et al., 2021; Alsharif et al., 2022; Alvino et al., 2020). Eye-tracking is instrumental in advertising and marketing data visualization in neuromarketing research (Azman et al., 2019). Traditional marketing methods, such as surveys and interviews, often fail to capture subconscious behavior that significantly impacts decision-making (Ahmed et al., 2023b).

Despite the growing importance of sustainability, a clear research gap remains. First, prior studies have largely relied on self-reported survey data, which may not capture subconscious and automatic processes influencing decisions (Ahmed et al., 2023a; Boz & Koç, 2022). Second, limited research has applied neuromarketing tools, such as eye-tracking, to examine how consumers actually respond to green hotel attributes (Ahmed et al., 2023a; Al-Nafjan et al., 2023; Fronda et al., 2021). Third, few studies connect specific green facilities to staying choices, leaving both theoretical and practical questions unanswered: theoretically, how subconscious processes fit into established consumer behavior models, and practically, which sustainability cues managers should emphasize to influence real decisions (Loureiro et al., 2022). To address this gap, this study uses eye-tracking to investigate how consumers' attention influences their decision to stay at green hotels, focusing on factors such as green facilities, price, familiar brands, and locations. Addressing these gaps is the central motivation for this study.

The research objectives (ROs) are to examine whether these factors affect consumers' eye movement and attention in relation to their stay decisions. By addressing these ROs, the study offers insights into the subconscious factors that drive consumer preferences for green hotels. Theoretically, it extends the S-O-R model by integrating neuromarketing evidence to explain how subconscious attentional processes influence choice. Practically, it offers actionable strategies for hotel managers and policymakers to improve the appeal and visibility of green initiatives, with implications that extend beyond Malaysia to other global tourism markets. Furthermore, this research contributes to a deeper understanding of sustainable tourism practices in Malaysia and has the potential to inform future policies and strategies in the hospitality industry.

The remainder of this paper is structured as follows: Section 2 provides the theoretical background and hypotheses development. Section 3 presents the methodology. Section 4 presents the results. Section 5 provides a discussion. Finally, Section 6 provides conclusion of the study, including contributions, limitations, and directions for future research recommendations.

2. Theoretical background and hypotheses development

This study selected four factors, including green facilities, price, familiar brands, and locations, which were selected for this study based on both theoretical and practical considerations. Prior research consistently highlights these attributes as primary determinants of hotel choice decisions (Chi, 2021; González-Rodríguez et al., 2020; Kim et al., 2016; Liu et al., 2022; Masiero et al., 2019; Yang & Mao,

2020). From a managerial perspective, these attributes also represent the most visible and frequently communicated elements in hotel marketing materials. While other variables, such as service quality or staff behavior, may also influence consumer decisions, these are less suited for visual attention measurement via eye-tracking. Thus, focusing on these four factors ensures both theoretical alignment with the S-O-R model and methodological suitability for neuromarketing tools.

2.1 Consumer staying decision

Decision-making involves an individual's tendency to engage in a behavior and their motivation to invest effort in it (Wang et al., 2023). Consumer behavior includes selecting, purchasing, or consuming products or services, driven by how well product attributes meet their needs in value, cost, and past satisfaction (Sihombing et al., 2023). Consumers are increasingly considering environmental responsibility, leading to pro-environmental behavior that aims to reduce the negative impact on the environment (Yusliza et al., 2020). Research identifies environmental attitude, knowledge, and memory as key predictors of such behavior, yet there is limited empirical research on what drives hotel consumers to choose green hotels (Matiza & Slabbert, 2025). With heightened awareness of environmental issues, consumers increasingly prefer green products, even if it means paying more or accepting lower performance (Zulfa & Andini, 2023). This awareness shapes consumer behavior, influencing green purchase decisions, defined as the preference for eco-friendly products over conventional ones (Cheng et al., 2022; Wang et al., 2019). Kamalanon et al. (2022) describe the green purchase decision as a determination to behave in a specific manner. González-Rodríguez et al. (2020) describe the green behavioral decision as the willingness to choose green hotels, recommend them, and pay a premium for the experience.

2.2 Stimulus-Organism-Response Model

This research employs the Stimulus-Organism-Response (S-O-R) model to investigate how consumers choose green hotels, which was proposed by Mehrabian (1974). The S-O-R model suggests that environmental stimuli influence cognitive and emotional responses, with social interactions and environmental cues playing a crucial role in consumer decision-making (Sthapit et al., 2024). The S-O-R model involves three stages: exposure to stimuli (S), emotional response (O), and resulting behavior (R). Hameed et al. (2022) highlight that subconscious emotions drive behavior, with green hotel features serving as stimuli that evoke responses, guiding decisions through techniques such as eye-tracking. Green hotels prioritize environmental sustainability, social responsibility, and resource efficiency, thereby reducing their carbon footprints and minimizing harm, while promoting sustainable practices for future generations (Gunduz Songur et al., 2023).

2.3 Green facilities

As consumers become more environmentally conscious, interest in eco-friendly hotels has surged, particularly in green tourism (Ferreira et al., 2025; Wang et al., 2023). In 2019, a Booking.com survey found that 72% of travelers recognized the need for sustainable travel choices, and by 2024, this rose to 83%, with 75% planning to adopt more sustainable practices (Booking.com, 2019; 2024). Ethical considerations motivated 32% of these travelers, and 70% preferred booking eco-certified accommodations (Booking.com, 2019; 2024). Consumers are increasingly willing to pay (WTP) a premium for sustainability (Akturan, 2020; Valenzuela et al., 2022; Wang et al., 2023). Historical surveys highlight this trend: in 1989, 67% of Americans were willing to pay 5% to 10% more for eco-friendly products (Kianpour & Asghari, 2012), and 79% of guests consider hotels' green practices as a critical factor when choosing their accommodation (Ali et al., 2023). Recent research confirms that guests are likelier to recommend hotels with green initiatives (Robin et al., 2017). Therefore, we formulated the following hypothesis to test:

H1: The green facilities have a positive influence on consumers' eye movement attention over their stay decision.

2.4 Price

Price is crucial in a business's profitability and sustainability, making it a key strategic component (Ahmed et al., 2023b; Liu et al., 2022; Wang et al., 2024). Price acceptability and perceived value are crucial pricing factors that influence consumer perceptions of a "normal price" based on product attributes and vary by consumer segment (Ahmed et al., 2023b; Alvino et al., 2020). Pricing significantly influences consumer behavior; typically, higher prices lead to lower sales, while lower prices increase sales (Zhao et al., 2021). Price is a crucial factor in purchasing decisions, often being the first question consumers ask when considering a product, brand, or even hotel (Alsharif & Isa, 2025; Cherubino et al., 2019). Research by Mody et al. (2023) emphasizes the importance of price in accommodation choices, with many consumers identifying it as the most significant factor. Special offers and discounts also strongly influence decisions (Temblador, 2019). Economic factors related to price are key drivers of purchasing decisions, and higher prices often deter consumers from buying environmentally friendly products (Alvino et al., 2020; Kianpour & Asghari, 2012). The rationale for this hypothesis lies in the strong cognitive salience of price information. Eye-tracking research shows that consumers allocate longer fixation durations to stimuli that directly affect perceived value and affordability (Alvino et al., 2020; Cherubino et al., 2019). In hospitality, price cues operate as heuristic shortcuts, reducing cognitive load by quickly signaling affordability and value (Johan et al., 2023). Thus, when price captures visual attention, it is likely to exert a causal influence on subsequent choice. Although this study focuses on direct attention-choice links, future research could explore potential interactions (e.g., price × brand familiarity) to capture more complex decision-making mechanisms. To explore these dynamics further, we have formulated the following hypothesis:

H2: The price has a positive influence on consumers' eye movement attention over their stay decision.

2.5 Familiar brand

Tourism is Malaysia's second-largest industry, with both local and international hotel brands widespread. Kotler & Keller (2016) define a brand as a combination of elements, such as names, symbols, or designs, that distinguish goods and services from those of competitors. Acar et al. (2024); Gutiérrez et al. (2024) add that a brand includes tangible and intangible attributes that build awareness, identity, and reputation; therefore, branding is crucial for standing out in a crowded marketplace. García-Madariaga et al. (2024); Light (2018) explain that consumer familiarity with a brand, built through knowledge and experience, leads to brand recognition and value. Research shows consumers prefer to purchase from familiar and trusted brands (Akkucuk & Esmaeili, 2016; Alsharif & Isa, 2025). As Delgado-Ballester et al. (2012); Garczarek-Bąk et al. (2021) describe, brand familiarity involves a consumer's ability to recognize and recall a brand. They found that familiar brands are easier to process and more popular due to established brand knowledge. Therefore, consumers prefer familiar brands because they require less effort to process information, are easier to retrieve and remember, and are generally more accepted and popular. Based on these findings, we have formulated the following hypothesis to test:

H3: The familiar brand has a positive influence on consumers' eye movement attention over their stay decision.

2.6 Location

Location, defined as "the place or position that something is in" (Cambridge, 2023), is critical in hotel selection. Tobler's first law of geography states that "everything is related to everything else, but

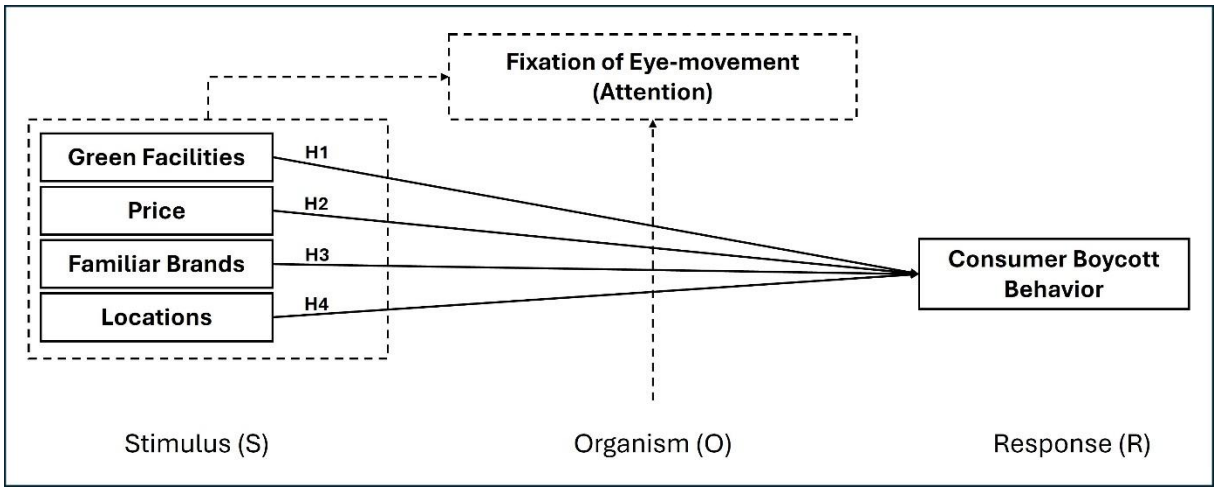
near things are more related than distant things" (Tobler, 1970). Studies by Kim et al. (2016); Yang & Mao (2020) identify location as the top factor influencing hotel choice. Yang et al. (2018) categorize location factors into three key areas: Accessibility to points of interest, transit convenience, and the surrounding environment. Accessibility to attractions locations (e.g., hotels) reduces transportation costs. Additionally, transit convenience, including proximity to airports and rail networks, is crucial for hotel performance (Lado-Sestayo et al., 2020; Zheng et al., 2022). The surrounding environment also influences satisfaction, with varying priorities among different types of travelers (Yang et al., 2018). Location significantly influences hotel selection and guest satisfaction, as it is widely recognized as a key factor in determining consumer choice (Masiero et al., 2019; Yang & Mao, 2020), we formulated the following hypothesis to test:

H4: The location has a positive influence on consumer's eye movement attention over their stay decision.

2.7 Conceptual model

Based on the S-O-R model, this study investigates how consumers' attention and emotions influence their decision to stay at green hotels, focusing on factors such as green facilities, price, familiar brands, and locations. Graph 1 shows the proposed research model.

Graph 1. **Proposed research framework**



Source: Authors' own work

3. Methodology

3.1 Respondent profile

Table 1 presents the demographic characteristics of 30 respondents, including 20 females (66.7%) and 10 males (33.3%). 23.30% of participants were between 18 and 24, with 70.0% aged 25-34 and 23.33% aged 18-24. Ethnically, 46.7% were Malay, 33.3% Chinese, and 20.0% Indian. Muslims were the largest religious group (46.7%). Most respondents were single (76.7%), and 73.3% held advanced degrees. Occupations included students (24%) and professionals (20.0%). Income distribution showed 60.0% earning below 1,000 MYR per month.

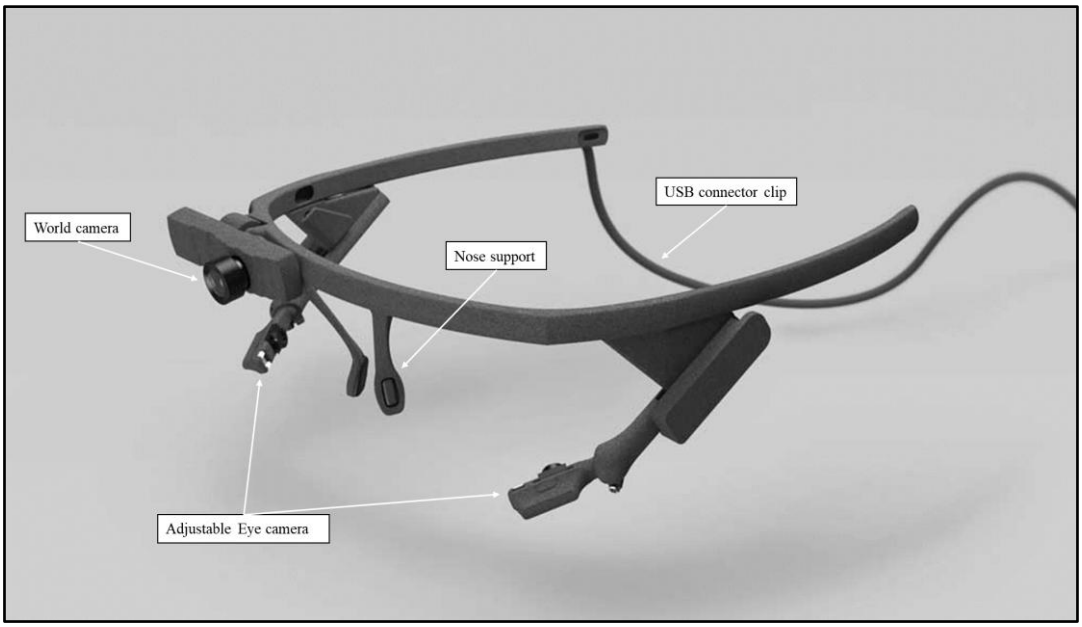
Table 1. **Respondents' demographics.**

Demographic factor	n	(%)	Demographic factor	n	(%)
Gender	*30*	*100*	*Marital Status*	*30*	*100.0*
Male	10	33.3	Single	23	76.7
Female	20	66.7	Married	7	23.3
Age	*30*	*100.0*	Widowed	-	-
18 - 24 years old	7	23.3	Divorced		
25 – 34 years old	21	70	*Education Level*	*30*	*100.0*
35 – 44 years old	2	6.7	Postgraduate (Master/PhD)	22	73.3
45 – 54 years old	-	-	Undergraduate (Foundation/ Matriculation/ STPM/ Diploma/ Degree)	8	26.7
55 years old and above	-	-	Secondary school	-	-
Race/Ethnicity	*30*	*100.0*	Primary school	-	-
Malay	14	46.7	*Occupation*	*30*	*100.0*
Chinese	10	33.3	Professional	6	20.0
Indian	6	20.0	Semi Professional	-	-
Other	-	-	Self-employed	-	-
Religion	*30*	*100.0*	Student	24	80.0
Islam	14	46.7	Unemployed	-	-
Buddhism	6	20.0	*Individual Monthly Income*	*30*	*100.0*
Hinduism	4	13.3	Below MYR 1,000	18	60.0
Christianity	2	6.7	MYR 1,000-2,999	6	20.0
Other	4	13.3	MYR 3,000–4,999	2	6.7
			MYR 5,000-6,999	2	6.7
			MYR 7,000-8,999	2	6.7
			MYR 9,000 and above	-	-
Total sample size	30	100.0			

Note: MYR (Malaysian Ringgit). Regarding the exchange rate, 1 USD = 4.38 MYR on the date 2024.08.19
Source: Authors' own work

3.2 Experimental design

Graph 2. **Eye-tracker and pupil core**



Source: Authors' own work

This study was designed to conduct a structured questionnaire and laboratory experiments at the University of Science Malaysia (USM). The questionnaire collected demographic data (gender, age, education, and income level) using categorical response options, while the research constructs were measured using a 5-point Likert scale. Laboratory experiments involved 30 volunteers (10 males and 20 females) with hotel experience, aged 18 and above, to explore factors influencing green hotel choices. Utilizing the S-O-R model, eye-tracking with the Pupil Core device (see Graph 2) monitored visual engagement with key decision factors—green facilities, price, familiar brands, and location. Modified images representing these factors were used, with eye-tracking data collected to identify the elements most influencing consumer decisions.

3.3 Sampling method

This study employed purposive sampling to select respondents aligned with the ROs, this method effectively targets individuals with specific characteristics meaningfully contributing to the research (Schreuder et al., 2001). Roscoe (1975) suggests sample sizes between 30 and 500 for most behavioral research, cautioning that larger samples may increase the risk of Type II errors. These guidelines are widely accepted, with the "rule of 30" supported by the Central Limit Theorem, which suggests that larger samples result in a normal distribution of sample means (Memon et al., 2020). Participants were recruited through an advertisement and offered a modest allowance, with an anticipated minimum of 30 respondents to participate. Participants were approached and encouraged to join the study through a recruitment poster (see Appendix), which was distributed both online (via university mailing lists and social media platforms) and offline (on campus notice boards and student activity centers). The poster explicitly stated the purpose of the research—"a study about green facilities using a neuromarketing approach"—and reassured volunteers that the experiment did not involve any life-threatening risk, thereby reducing potential concerns about the use of eye-tracking technology. To ensure suitability, the eligibility criteria were clearly listed, including age between 18 and 50 years, normal or corrected-to-normal vision, and basic knowledge of green facilities. To motivate participation, the poster emphasized several practical benefits: a RM 40 token of appreciation, a short 15-minute session, and a transparent description of the study procedure, which consisted of two parts (a short questionnaire and an eye-tracking task). The combination of safety assurance, time efficiency, financial incentive, and procedural

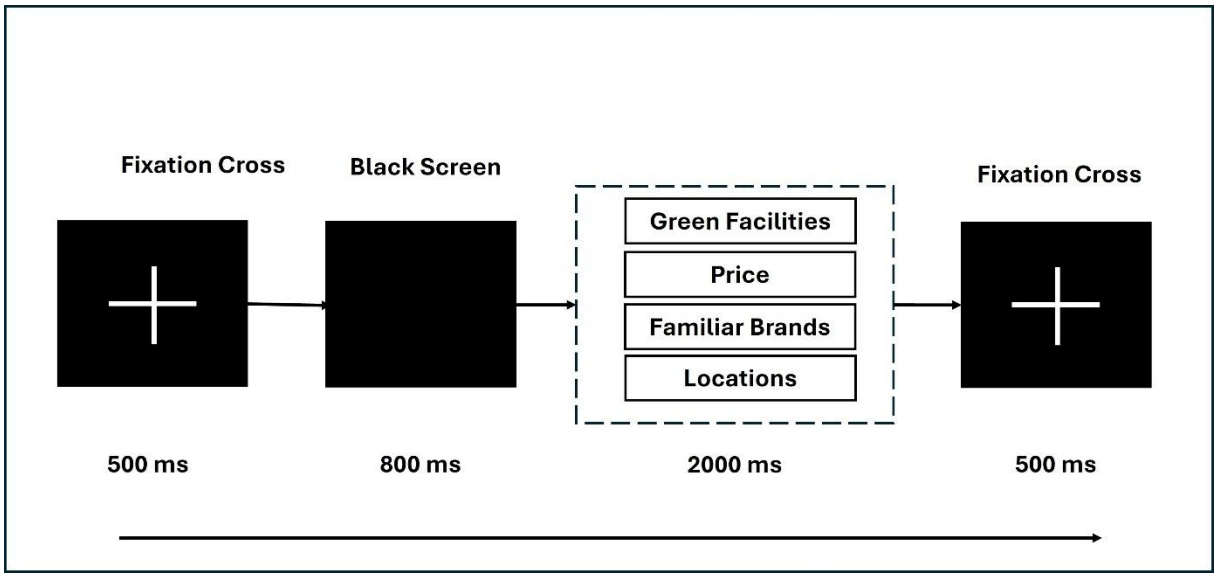
clarity successfully encouraged individuals to volunteer, ultimately yielding the required sample of 30 participants.

3.4 Data collection

The data collection process for this study involved designing stimuli to analyze participants' eye movements and gathering data, allowing researchers to explore participants' subconscious responses to various independent variables (e.g., green facilities, price, familiar brands, and locations). Each session began with a fixation mark (+) followed by stimuli presented in randomized categories and orders using Pupil Capture software (see Graph 3). The duration of each stimulus presentation involved a 500-millisecond period with a black fixation cross, followed by 800 milliseconds of viewing a black screen before the visual stimulus was presented, lasting for 2000 milliseconds. Subsequently, each exercise concluded with a 500-millisecond black fixation cross before the next respondent commenced.

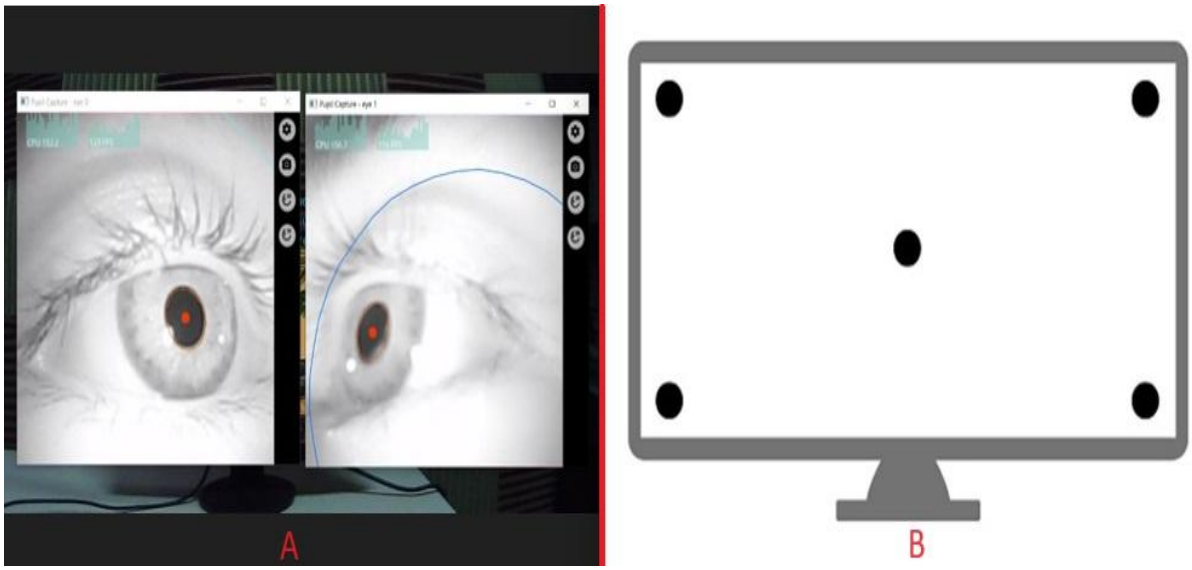
Participants sat in front of a monitor equipped with a Pupil Core Eye-Tracker, calibrated to map pupil and gaze positions. Calibration, shown in Graph 4 (a & b), ensured accurate tracking. High-quality eye videos were essential, so adjustments were made for clear images at extreme angles. Participants then focused on stimuli representing variables such as green facilities, price, familiar brands, and location. Green facilities included water and energy conservation, anti-smoking policies, biodegradable products, and recycling bins.

Graph 3. **Process of eye-tracking experiment**



Source: Authors' own work

Graph 4. **(a) Pupil detection and (b) 5 points of calibration**



Source: Authors' own work

The study featured well-known hotel brands committed to green practices: Parkroyal Collection, W Hotels, Mandarin Oriental, and Shangri-La Rasa Sayang (Bradea, 2023; Rashid, 2022). Parkroyal Collection emphasizes sustainable design with biodegradable packaging and a food waste management system (Rashid, 2022). W Hotels combines glamour with sustainability, using energy-efficient LED lighting to cut energy costs by 39% (Bradea, 2023). Mandarin Oriental has the highest SEDA grade in Kuala Lumpur, eliminating 99% of single-use plastics and ensuring responsible sourcing (Asset, 2023; Khan, 2024). Shangri-La Rasa Sayang, recognized by Malaysia's Ministry of Tourism and Culture, implements extensive sustainability measures, earning the ASEAN Green Hotel Award for eight years (Choong, 2024). Images of these hotels' sustainable features were used in the eye-tracking experiment, shown from Graphs 5.

Graph 5. **Stimuli of the combination of the variables for the eye-tracking experiment**

Source: Authors' own work

The key eye-tracking metrics employed in this study include fixation duration (the length of time participants focused on specific AOIs) and heat maps that visualize aggregated attention across stimuli. These metrics were chosen because they provide reliable indicators of cognitive engagement and attentional salience (Azman et al., 2019). Fixation durations were directly linked to the four hypotheses, allowing the study to determine whether each factor (green facilities, price, familiar brand, and location) significantly captured visual attention and, by extension, influenced staying decisions. Including these metrics ensures that the hypotheses can be tested empirically, rather than only descriptively.

3.5 Data analysis

The eye-tracking data were analyzed using Pupil Player software, which defines AOIs and provides visualizations, such as heat maps. Descriptive statistics were interpreted using IBM SPSS software (Rahman & Muktadir, 2021). Assessing data normality was crucial, as many tests assume a Gaussian distribution. The Shapiro-Wilk test, effective for small to moderate samples, evaluated normality (Easily, 2023). This, along with visual inspections like histograms, helped determine the suitability of parametric tests (Malato, 2023).

The study employed One-way ANOVA to assess variations among group means based on a single independent variable, relying on assumptions like normally distributed dependent variables and homogeneous variances (Bevans, 2024). Post hoc analysis with the Bonferroni test identified specific group differences, adjusting for multiple comparisons. A Paired Sample T-Test compared means within the same group under different conditions, focusing on the average difference between paired observations (Frost, 2021) and assuming normal distribution (Gleichmann, 2020).

4. Results

4.1 Hypotheses test

4.1.1 Normality tests

The Shapiro-Wilk test was employed to assess the normality of data across various areas of interest (AOIs), providing critical insights into the distribution characteristics necessary for subsequent statistical analysis (Malato, 2023). Table 2 reveals that most AOIs have p-values greater than 0.05, indicating no significant deviation from normality. For instance, AOI 105 (p=0.577), AOI 107 (p=0.722), and AOI 142 (p=0.892) demonstrate strong evidence of normal distribution, with Shapiro-Wilk statistic values ranging from 0.93 to 0.98, further supporting this conclusion.

The normality assumption is crucial for applying parametric tests like ANOVA and T-tests, which are more robust and reliable than non-parametric alternatives (Ghasemi & Zahediasl, 2012). Confirming normality validates the use of these methods, enhancing the study's accuracy. Visual inspection of histograms confirmed the normal distribution of the data. The Shapiro-Wilk test results affirm normality for most AOIs, supporting parametric techniques and enhancing the interpretability and generalizability of findings on consumer behavior toward green hotels, as tabulated in Table 2.

Table 2. **The Shapiro-Wilk Test for normality test of AOIs.**

Variables	Shapiro-Wilk			Variables	Shapiro-Wilk		
	Statistic	df	Sig.		Statistic	df	Sig.
AOI 105	0.971	30	0.577	AOI 124	0.933	30	0.060
AOI 106	0.952	30	0.187	AOI 125	0.945	30	0.127

AOI 107	0.976	30	0.722	AOI 126	0.939	30	0.084
AOI 108	0.955	30	0.224	AOI 127	0.943	30	0.110
AOI 109	0.969	30	0.523	AOI 128	0.967	30	0.452
AOI 110	0.956	30	0.244	AOI 129	0.951	30	0.175
AOI 111	0.955	30	0.230	AOI 130	0.936	30	0.073
AOI 112	0.959	30	0.297	AOI 131	0.947	30	0.142
AOI 113	0.966	30	0.428	AOI 132	0.959	30	0.293
AOI 114	0.965	30	0.413	AOI 133	0.939	30	0.085
AOI 115	0.954	30	0.222	AOI 134	0.946	30	0.133
AOI 116	0.943	30	0.108	AOI 135	0.934	30	0.064
AOI 117	0.952	30	0.197	AOI 136	0.966	30	0.435
AOI 118	0.937	30	0.077	AOI 137	0.969	30	0.521
AOI 119	0.941	30	0.097	AOI 138	0.963	30	0.376
AOI 120	0.962	30	0.343	AOI 139	0.975	30	0.676
AOI 121	0.941	30	0.098	AOI 140	0.973	30	0.637
AOI 122	0.942	30	0.100	AOI 141	0.974	30	0.657
AOI 123	0.955	30	0.225	AOI 142	0.983	30	0.892

Sig. or P-value > 0.05; AOI: area of interest; df: degree of freedom; Shapiro-Wilk between 0 and 1
Source: Authors' own work

4.1.2 One-way ANOVA and Bonferroni Post Hoc test

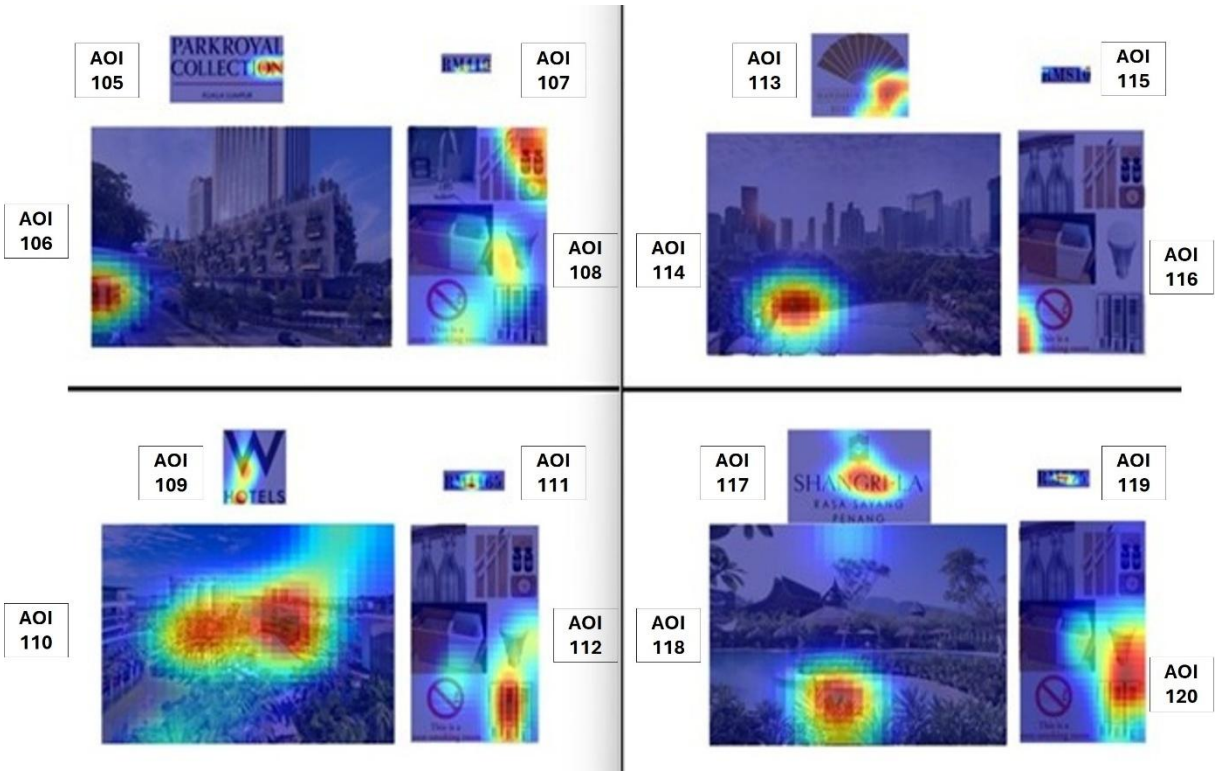
In this research, the necessary conditions for conducting an ANOVA were verified: normality, homogeneity of variances, and absence of outliers. Therefore, the study proceeded with the ANOVA. This method involves conducting t-tests for pairwise comparisons between group means and adjusting the error rate for each comparison, thus effectively addressing concerns associated with multiple testing scenarios (IBM, 2023).

Graph 6 displays the AOIs and heat maps for four hotel advertisements, showing viewer attention through eye-tracking. Warmer colors (red and yellow) indicate higher focus. In Parkroyal Collection, Mandarin Oriental, W Hotels, and Shangri-La ads, viewers concentrated on central and right-side details, with logos receiving less attention.

Graph 6 shows that the results of the heat map analysis indicate that consumers directed considerable visual attention toward green facilities, price, brand familiarity, and location, confirming the proposed hypotheses. Green facilities (AOIs 108, 112, 116, 120) attracted notable fixation intensity, with strong attention directed at eco-friendly cues such as recycling bins, water-saving devices, and non-smoking signs. Similarly, price information (AOIs 107, 111, 115, 119) generated substantial fixation clusters, with particularly high engagement observed for prices presented in more attractive formats. These findings demonstrate that both green facilities and price cues serve as salient stimuli that capture consumer attention and play a significant role in shaping stay decisions.

Furthermore, the results further show that familiar brands and location also received substantial consumer attention. Well-known hotel brands (AOIs 105, 109, 113, 117) such as W Hotels and Shangri-La recorded strong fixation densities, indicating that familiar brands are influential in guiding consumer preferences. Likewise, hotel location cues (AOIs 106, 110, 114, 118) elicited wide fixation spreads, particularly on attractive environmental and setting features, highlighting the importance of location in consumer evaluation of accommodation options. These findings support H1–H4 by confirming that green facilities, price, brand familiarity, and location all exert positive influences on consumer eye movement attention and thereby contribute to their stay decisions.

Graph 6. **Shows the heat map of AOIs**



Source: Authors' own work

Table 3 reveals no significant differences for Parkroyal Collection ($f(3, 116) = 1.998$, $p = 0.118$). According to Bobbitt (2021), the p-value in statistical analysis indicates a greater variance between group means and individual variability, suggesting an evenly distributed attention among brand, locations, prices, and green facilities.

Significant differences were found for W Hotels ($f(3, 116) = 29.267$, $p = 0.001$), followed by Mandarin Oriental ($f(3, 116) = 25.856$, $p = 0.001$), and Shangri-La Rasa Sayang ($f(3, 116) = 17.167$, $p = 0.001$), suggesting certain advertisement elements drew more attention. According to Bobbitt (2021), a p-value below 0.05 in an ANOVA test necessitates a post hoc analysis to pinpoint the specific groups among which differences exist. This indicates that certain elements within these advertisements attracted more attention than others. Bonferroni post hoc tests were used to identify significant differences in AOIs within advertisements, adjusting the significance level by dividing 0.05 by the number of comparisons (McClenaghan, 2023).

Table 4 shows that for W Hotels, the brand (AOI 109) significantly differed from location (AOI 110) and price (AOI 111), but not from green facilities (AOI 112). Location (AOI 110) differed from the brand and green facilities, but not in terms of price. At Mandarin Oriental, the brand (AOI 113) differed from price (AOI 115) and green facilities (AOI 116), but not from location (AOI 114). The location differed from the price and green facilities, but not from the brand. For Shangri-La Rasa Sayang, the brand (AOI 117) differed significantly from all AOIs. Location (AOI 118) differed from the brand and green facilities, but not from price. Overall, brand and price elements were more effective in capturing consumer attention than location or green facilities.

Table 3. **ANOVA analysis for fixation duration of AOIs 105–120.**

Areas of interest	Mean (SD) of fixation duration, (n= 30)	f(df)	p-value
	Parkroyal Collection		
AOI 105	3346.75 (1014.07)	1.998 (3, 116)	0.118

AOI 106	3271.57 (894.28)		
AOI 107	3666.91 (854.89)		
AOI 108	3749.62 (854.89)		
	W Hotels		
AOI 109	4352.92 (1047.61)	29.267 (3, 116)	0.001
AOI 110	5643.58 (1057.32)		
AOI 111	5514.69 (714.38)		
AOI 112	3849.09 (667.23)		
	Mandarin Oriental		
AOI 113	5754.36 (1105.88)	25.856 (3, 116)	0.001
AOI 114	5354.39 (1155.54)		
AOI 115	3664.20 (1211.59)		
AOI 116	3742.38 (1184.52)		
	Shangri-La Rasa Sayang		
AOI 117	7065.01 (1520.10)	17.167 (3, 116)	0.001
AOI 118	5622.58 (1820.47)		
AOI 119	5820.49 (1646.69)		
AOI 120	4309.33 (747.66)		

SD: Standard deviation, f(df): F-statistic with degree of freedom; P < 0.05
Source: Authors' own work

Table 4. **Post Hoc Analysis (Bonferroni) for AOIs 109-120.**

Variables		Sig.	Variables		Sig.
		W Hotels			
AOI 109	AOI 110	0.001	AOI 110	AOI 109	0.001
	AOI 111	0.001		AOI 111	1.000
	AOI 112	0.182		AOI 112	0.001
AOI 111	AOI 109	0.001	AOI 112	AOI 109	0.182
	AOI 110	1.000		AOI 110	0.001
	AOI 112	0.001		AOI 111	0.001
		Mandarin Oriental			
AOI 113	AOI 114	1.000	AOI 114	AOI 113	1.000
	AOI 115	0.001		AOI 115	0.001
	AOI 116	0.001		AOI 116	0.001
AOI 115	AOI 113	0.001	AOI 116	AOI 113	0.001
	AOI 114	0.001		AOI 114	0.001
	AOI 116	1.000		AOI 115	1.000
		Shangri-La Rasa Sayang			
AOI 117	AOI 118	0.002	AOI 118	AOI 117	0.002
	AOI 119	0.010		AOI 119	1.000
	AOI 120	0.001		AOI 120	0.005
AOI 119	AOI 117	0.010	AOI 120	AOI 117	0.001
	AOI 118	1.000		AOI 118	0.005

AOI 120	0.001	AOI 119	0.001

Sig. or P < 0.05; AOI: Area of interests
Source: Authors' own work

The results from the one-way ANOVA and Bonferroni post hoc tests reveal clear differences in the extent to which participants allocated attention to the four hotel attributes. Price, green facilities, and brand familiarity consistently attracted the highest levels of visual focus, while location also received attention but to a comparatively lesser degree. These findings confirm that consumers do not distribute their attention evenly across all stimuli; instead, certain cues dominate the decision-making landscape. However, while these results establish broad differences across factors, they do not yet capture the more nuanced pairwise contrasts that can further clarify how one attribute competes with another in shaping attentional patterns.

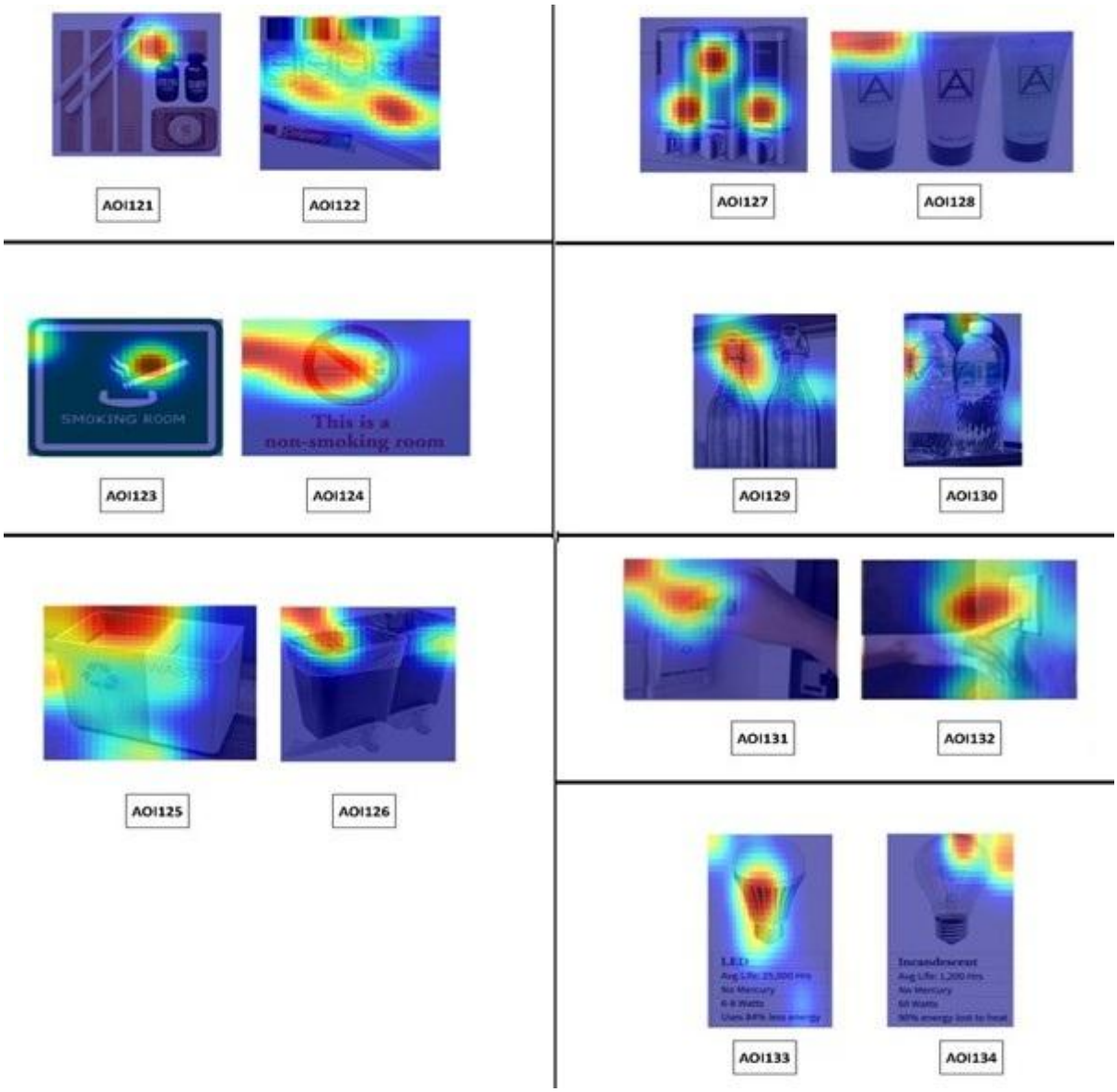
4.1.3 Paired sample T-test

To provide a deeper understanding of these differences, paired sample t-tests were conducted to examine direct comparisons between the attributes. This analysis enables a more detailed examination of attentional trade-offs, such as whether price draws significantly more attention than green facilities, or whether brand familiarity competes more strongly with location in influencing gaze allocation. The results offer a more precise account of how consumers prioritize visual information when evaluating green hotel options.

The study met all necessary conditions for a paired sample t-test, including normal distribution, independent observation sampling, appropriate measurement scale, and adequate group matching. In the heat map, warmer colors indicate a high focus on product details, such as toiletries, suggesting an interest in branding and key information. Middle-row signs for smoking status received notable attention, while the bottom row's focus on waste bins and light switches highlights interest in sustainability features.

Graph 7 revealed that green facilities significantly influence consumers' eye movement attention, by extension, their stay decisions. Visual fixation hotspots are highly concentrated on sustainable features such as biodegradable toiletries (AOI121), eco-friendly bath products (AOI127), glass water bottles (AOI129), recycling bins (AOI125), room cards for electricity activation (AOI 131), LED lighting (AOI133), and non-smoking rooms (AOI124), all of which received stronger attention compared to non-green facilities. These patterns suggest that consumers are more visually engaged with sustainable cues, indicating that green facilities are not only noticed but also more thoroughly processed cognitively, making them influential factors in shaping hotel stay decisions.

Graph 7. **Shows the heat map of AOIs**



Source: Authors' own work

The Paired Sample T-test results in Table 5 show significant differences in consumer attention toward green hotel facilities. Non-smoking rooms (AOI 124) received more attention (mean = 2596.79) than smoking rooms (AOI 123), $t(29) = 2.654$, $p = 0.013$. However, green facility like biodegradable toiletries (AOI 121) is not supported, while other facilities, such as glass water bottles (AOI 129), shampoo and body wash in glass bottle (AOI 127), room cards for electricity activation (AOI 131), and recycle basket have received higher attention than non-sustainable (green) facilities.

Table 5. **Paired Sample T-Test for fixation duration of AOIs 121–134.**

Areas of interest	Mean (SD) of fixation duration, (n= 30)	t	df	p-value
AOI 121	2938.65 (1127.23)	2.681	29	0.012
AOI 122	3181.52 (1228.38)			
AOI 123	2316.10 (866.01)	2.654	29	0.013
AOI 124	2596.79 (985.17)			
AOI 125	3046.75 (1015.95)	0.525	29	0.604

AOI 126	3007.26 (1024.43)			
AOI 127	3599.21 (1479.51)	0.240	29	0.812
AOI 128	3557.63 (1644.13)			
AOI 129	3690.57 (1490.37)	2.860	29	0.008
AOI 130	3462.66 (1544.01)			
AOI 131	3736.20 (1464.20)	2.733	29	0.011
AOI 132	3553.83 (1341.98)			
AOI 133	3499.92 (1647.33)	0.785	29	0.439
AOI 134	3479.62 (1657.61)			

SD: Standard deviation, df: Degree of freedom, t: t-value; $P < 0.05$
Source: Authors' own work

Graph 8. **Shows the heat map of AOIs**

Source: Authors' own work

Graph 8 illustrates that participants directed substantial visual attention toward the price tags across different hotel options, with clear hotspots on discounted or lower-priced offers. For instance, AOI135 (RM409.99) and AOI139 (RM809.99) received stronger visual fixations compared to their rounded counterparts, AOI136 (RM410) and AOI140 (RM810), indicating that consumers were more attentive to prices that suggested psychological appeal or better value. Similarly, AOI137 (RM1164.99) drew intense attention compared to AOI138 (RM1165), and AOI141 (RM779.99) was more engaging than AOI142 (RM780). This consistent pattern across all pairs suggests that consumers are not only highly sensitive to price information but are also more attentive to prices framed with decimals (e.g., ".99"), which they perceive as better deals. These results highlight that price cues play a critical role in shaping visual attention, reinforcing the notion that consumers actively process price as a decisive factor in their hotel stay decisions.

The Paired Sample T-test results in Table 6 compare attention to price presentations in hotel advertisements. At Parkroyal Collection, prices with decimals (AOI 135) received significantly more attention (mean = 4795.21) than rounded prices (AOI 136), $t(29) = 2.223$, $p = 0.034$. Conversely, at W Hotels and Shangri-La Rasa Sayang, rounded prices (AOIs 138 and 142) attracted more attention than

decimal prices, t(29) = 9.941, p = 0.001 and t(29) = 10.132, p = 0.001, respectively. No significant difference was found at Mandarin Oriental. Rounded/decimal prices generally capture more attention than decimalized prices.

Table 6. **Paired Sample T-Test for fixation duration of AOIs 135–142.**

Areas of interest	Mean (SD) of fixation duration, (n= 30)	t	df	p-value
	Parkroyal Collection			
AOI 135	4795.21 (3174.14)	2.223	29	0.034
AOI 136	3487.09 (1419.16)			
	W Hotels			
AOI 137	5069.92 (975.920)	9.941	29	0.001
AOI 138	4545.45 (1001.29)			
	Mandarin Oriental			
AOI 139	3595.60 (1058.13)	1.941	29	0.062
AOI 140	3552.89 (1049.25)			
	Shangri-La Rasa Sayang			
AOI 141	4334.60 (1342.41)	10.132	29	0.001
AOI 142	4069.89 (1307.13)			

P < 0.05; t: t-value
Source: Authors' own work

The present results reflect attentional salience that influences staying decisions, as eye-tracking captures the subconscious "touchpoints" that attract consumer focus and serve as reliable precursors to choice behavior. Although participants were not asked to make a direct booking decision, the experimental design simulated a realistic choice environment by presenting hotel advertisements and observing which attributes consistently drew attention. This approach aligns with neuromarketing research, which indicates that visual attention often precedes and predicts actual purchase or selection behavior, with sustained fixation and repeated gaze serving as robust indicators of consumer preference (Cherubino et al., 2019). By focusing on subconscious processes rather than self-reported intentions, the study circumvents the limitations of traditional surveys, which may be susceptible to bias or socially desirable responses. The findings therefore offer valuable insight into the factors most likely to drive consumer choice—particularly price and brand familiarity—while also demonstrating the meaningful but more modest influence of green facilities and location. Importantly, this highlights the role of attention as a mediating mechanism between environmental stimuli and consumer decision-making, providing a pathway for future research to link subconscious attention with explicit behavioral outcomes.

5. Discussion

While the results section initially presents findings in a structured listing (normality tests, ANOVA, post hoc tests, and paired t-tests), these outcomes are closely linked through their collective demonstration of how subconscious attention varies across stimuli. For example, fixation hotspots on green facilities were consistently aligned with strong statistical evidence from both heat map analysis and paired sample t-tests, reinforcing H1. Similarly, the ANOVA and Bonferroni results demonstrated that price and brand familiarity attracted significantly more attention than locations (H4), which ties directly to H2 and H3. By synthesizing these results, the study shows a coherent narrative. Although all four hypotheses were supported, price, green facilities, and brand familiarity emerged as the dominant influences on consumer attention, while location and green facilities played relatively supporting roles.

The findings shed light on consumers' decision-making processes regarding green hotels. The results indicate that price, green facilities, and familiar brand elements generally capture consumer attention more than the location factor. The significant importance of familiar brands is supported by Delgado-Ballester et al. (2012); Garczarek-Bąk et al. (2021), whose multiple studies indicate that well-known brands have a significant advantage over lesser-known ones in terms of ease of information processing and attitudes. The four brands chosen for this research (e.g., Parkroyal Collection, W Hotels, Mandarin Oriental, and Shangri-La Rasa Sayang) are renowned brands operating hotels and other accommodations both inside and outside of Malaysia (Bradea, 2023; Bradley, 2024; Khan, 2024; Rashid, 2022).

Hypothesis (H1), which posited that green facilities would significantly influence consumer attention, was supported by the findings. The study revealed that non-smoking rooms (AOI 124) ($t(29) = 2.654$, $p = 0.013$) received significantly more attention than smoking rooms. This result reinforces the growing body of literature emphasizing the importance of health-related environmental cues in hospitality settings. Non-smoking features are not only aligned with sustainability but also strongly associated with personal well-being, which likely explains their ability to attract heightened visual attention. This aligns with previous studies suggesting that consumers prioritize eco-friendly attributes that are simultaneously perceived as directly beneficial to their health and comfort (Chi, 2021; Han et al., 2010). Interestingly, other green initiatives, such as biodegradable toiletries (AOI 121), attracted less attention compared to others. Additionally, more tangible or operationally visible features, such as glass water bottles (AOI 129), electricity-activation room cards (AOI 131), shampoo and body wash in glass bottles (AOI 127), energy-efficient LED lighting (AOI 133), and recycling facilities (AOI 125) received higher attention than non-green facilities. This indicates that consumers are more attentive to sustainability features that are highly visible, functional, and integrated into the guest experience, rather than those perceived as minor or peripheral.

Hypotheses (H2) are supported: The findings revealed that participants consistently devoted greater visual attention to price tags ending in "0.99" compared to their rounded counterparts. For instance, RM 409.99 (AOI135) and RM 809.99 (AOI139) elicited stronger fixation durations than RM 410 (AOI136) and RM 810 (AOI140), while RM 1164.99 (AOI137) and RM 774.99 (AOI 141) attracted more gaze than RM 1165 (AOI138) and RM 775 (AOI 142). These results provide empirical evidence of the psychological pricing effect, particularly the left-digit bias, where consumers disproportionately encode the leftmost digit of a price and perceive decimalized figures as lower in value (Thomas & Morwitz, 2009). Eye-tracking further reveals that decimalized prices are not only cognitively processed but also visually salient, confirming that pricing format functions as a subconscious attentional cue. Such patterns are consistent across both lower and higher price tiers, suggesting that psychological pricing mechanisms are robust in the hospitality context and not limited to budget-sensitive consumers. Rather than attributing this pattern solely to respondents' lower income levels or assumptions about their willingness to pay, the present results are more cautiously interpreted as evidence of the attentional salience of price cues. Alternative explanations—such as the perceptual prominence of numerical formats (e.g., rounded vs. decimal prices) or cultural familiarity with pricing conventions—may also explain these findings. Thus, while the data confirm that price stimuli significantly affect consumers' eye movement attention, further research is required to disentangle the cognitive and perceptual mechanisms underlying these effects. This cautious interpretation is supported by a recent study of Johan et al. (2023), which proposed that a consumer's first interaction with a hotel involves inquiring about price and availability, making price a critical determinant in the decision-making process.

Hypotheses (H3) are supported: The results demonstrate that brand familiarity (AOIs 105, 109, 113, 117) elicited strong fixation densities, particularly for internationally recognized hotels such as W Hotels and Shangri-La. This outcome reinforces the role of brand familiarity as a powerful heuristic cue in consumer decision-making. Well-established brands serve to simplify complex evaluations by reducing the cognitive effort required to assess quality, thereby facilitating faster and more confident judgments (Delgado-Ballester et al., 2012; Garczarek-Bąk et al., 2021). Eye-tracking evidence confirms that such

brands do not merely influence explicit attitudes but also capture subconscious visual attention, highlighting their dual function as both cognitive and perceptual anchors. Moreover, brand familiarity enhances trust and mitigates perceived risk, which is particularly relevant in high-involvement contexts, such as hotel selection, where consumers must evaluate multiple attributes under conditions of uncertainty. These findings suggest that strong brand equity not only supports rational choice processes but also shapes attentional priorities at the earliest stages of evaluation, underscoring its strategic value in competitive hospitality markets.

Hypothesis H4 is supported: The findings indicate that the location stimulus is the least significant compared to the other three variables in this experiment. The results reveal that location shows a significant difference from some variables but not all. For example, the location of the Parkroyal Collection does not significantly differ from other variables. In contrast, the locations of W Hotels and Shangri-La Rasa Sayang significantly differ from brand and green facilities, while the location of Mandarin Oriental shows significant differences from both price and green facilities. However, this outcome is likely influenced by the type of visual stimuli used in this study—static scenic images—rather than a lack of importance of location in real-world hotel selection. Prior research consistently identifies location as a central determinant of consumer choice (Masiero et al., 2019; Yang & Mao, 2020). Thus, while H4 is supported, the interpretation should be cautious, and future research could employ more dynamic or interactive representations of location cues.

It is important to clarify that the present study does not equate eye-tracking data with definitive choice behavior. Eye-tracking captures subconscious processes such as attentional salience and engagement, which are antecedents of choice rather than direct evidence of booking decisions. The simulated decision environment and fixation-based metrics provide robust evidence of attentional drivers; however, future research should integrate explicit choice tasks or behavioral measures to link subconscious attention with actual decision-making. By repositioning eye-tracking within this broader framework, the contribution of this study becomes clearer. Rather than claiming to measure choice directly, the results provide a nuanced account of how subconscious attention shapes the pathway leading to choice. This distinction separates empirically grounded results (fixation patterns) from conjectural explanations, ensuring that interpretations remain evidence-based while highlighting directions for further exploration**.** Table 7 provide the summary of the hypothesis result.

Table 7. **Summary of hypothesis testing.**

Hypothesis	Result
H1: The green facilities have a positive influence on consumers' eye movement attention over their stay decision.	Supported
H2: The price has a positive influence on consumers' eye movement attention over their stay decision.	Supported
H3: The familiar brand has a positive influence on consumers' eye movement attention over their stay decision.	Supported
H4: The location has a positive influence on consumers' eye movement attention over their stay decision.	Supported

Source: Authors' own work

6. Conclusion

6.1 General conclusion

This study aimed to investigate how four key hotel attributes—green facilities, price, brand familiarity, and location—capture consumer visual attention and influence their stay decisions, utilizing

eye-tracking as a neuromarketing tool. The findings demonstrate that price, green facilities, and brand familiarity exert the strongest influence on visual attention, while location also contributes meaningfully, particularly when the sustainability features are visible and directly integrated into the guest experience. These results support the hypotheses developed and extend prior research by highlighting the role of subconscious attention in shaping consumer perceptions of hotels. Importantly, the conclusions of this study must be interpreted in alignment with its aim. The research does not claim to measure final booking choices directly; rather, it examines attentional salience as an antecedent to choice, showing how subconscious attention can guide consumer preference formation in the early stages of decision-making. This clarification ensures that the findings are consistent with the original purpose of the study.

In terms of application, the research is most relevant to the online search and evaluation stage of the customer journey. When consumers browse hotel booking platforms, websites, or digital advertisements, price and brand cues are immediately visible, while some green attributes—such as non-smoking policies, energy-efficient lighting, or refillable toiletries—may not appear until later in the decision process. This limitation highlights that the present model is better suited for examining the impact of sustainability signals that are made visible before or during online search, rather than features revealed only after check-in. Future research should therefore refine the model by distinguishing between "pre-booking signals" (e.g., price, brand, online eco-labels) and "post-booking signals" (e.g., in-room green facilities), to more accurately capture the temporal sequence of consumer decision-making.

6.2 Contributions

6.2.1 Theoretical contributions

This study contributes to theory by extending the Stimulus–Organism–Response (S-O-R) model with neuromarketing evidence, particularly through the use of eye-tracking to capture subconscious attentional processes (e.g., fixation of eye-movement). Whereas most hospitality research relies heavily on self-reported data, this study demonstrates that consumers' subconscious reactions reveal different behavioral drivers, offering richer insights into decision-making mechanisms. The findings also provide empirical support for the well-documented attitude–behavior gap in sustainable consumption. Although consumers often claim to value green initiatives, their subconscious attention was more strongly directed toward price and brand familiarity, suggesting that economic and heuristic cues frequently override environmental considerations. This reinforces the importance of integrating dual-process theories into sustainable consumption research, where automatic, subconscious processes interact with reflective, attitudinal ones. Additionally, the results deepen theoretical understanding of brand influence by confirming that brand familiarity operates as a heuristic shortcut that reduces cognitive effort and dominates attention in complex decision-making environments. Finally, the study advances methodological discussions in hospitality and consumer behavior by showing how neuromarketing tools, such as eye-tracking, can complement traditional approaches and provide novel insights into consumer psychology.

6.2.2 Practical contributions

The study also carries important practical contributions for hotel managers, marketers, and policymakers. The strong effect of pricing highlights the need for careful price presentation, as even subtle cues, such as rounded versus decimal figures, significantly shaped consumer attention. For managers, this underscores the importance of transparent, strategically framed pricing strategies. Equally important is the influence of brand familiarity, which suggests that investments in building brand equity, recognition, and trust can yield substantial competitive advantages in attracting and retaining customers. Furthermore, green facilities have attracted attention in the experimental setting; they remain critical for long-term positioning. Managers are encouraged to make sustainability features more visible and engaging, for example, by showcasing eco-friendly practices in marketing campaigns, using certification

logos in promotional materials, and offering guests tangible experiences of green initiatives. Location, though less influential compared to price, green facilities, and brand, continues to play a supporting role in shaping consumer choices, particularly when linked to convenience and accessibility. Beyond the hotel level, policymakers can reinforce sustainable consumption by strengthening eco-certification schemes, launching public awareness campaigns, and offering incentive programs that reduce skepticism and build trust in green hospitality practices. These combined efforts can help bridge the gap between consumers' pro-environmental attitudes and their actual behavioral choices, supporting both industry competitiveness and broader sustainability goals.

6.2.3 Methodological contributions

This study makes an important methodological contribution by introducing neuromarketing tools, specifically eye-tracking technology, into the examination of consumer decision-making in the tourism and hospitality sector. Whereas previous research on green hotels has primarily relied on self-reported survey data, this study demonstrates the value of integrating objective, real-time measures of visual attention to capture subconscious cognitive processes. Recording fixation of eye movements provides insights that are not accessible through traditional questionnaires and helps to uncover discrepancies between stated preferences and actual behavior. Furthermore, by embedding eye-tracking experiments within the Stimulus–Organism–Response (S-O-R) model, the research illustrates how neuromarketing methods can be systematically aligned with established behavioral theories. This integration offers a replicable framework for future hospitality and tourism studies, enabling researchers to move beyond self-reported intentions and to explore the subconscious drivers of sustainable consumption. Methodologically, the study demonstrates how combining survey-based data with laboratory-based neuromarketing techniques enhances the validity, reliability, and depth of consumer research.

6.3 Limitations

This article identifies several limitations and research gaps in understanding consumer behavior regarding green hotels, providing a basis for future recommendations to address these issues. One significant limitation is the reliance on traditional survey methodologies in previous studies, which often prompt respondents to answer specific questions and may not capture the complexity and subconscious nature of consumer decision-making. This highlights the need for innovative approaches, such as the neuromarketing techniques employed in this study, to gain a deeper understanding of consumer behavior.

6.4 Future recommendations

Future research should expand the application of neuromarketing techniques to examine a broader range of stimuli, providing deeper insights into consumer preferences and identifying impactful green initiatives. It is crucial to explore consumer staying decisions from new perspectives, focusing on subconscious behavior using tools like eye-tracking. Integrating additional neuromarketing methods, such as fMRI or EEG, could provide a more holistic view of cognitive processes in decision-making. The study identifies a lack of empirical knowledge on consumer environmental concerns, especially in Malaysia, highlighting a gap in understanding consumer responses to green hotels. Future studies should include larger, diverse samples to improve generalizability and explore demographic differences in reactions to green initiatives.

Additionally, exploring cultural and regional differences in consumer responses is vital for global hospitality brands. Investigating external factors, such as economic conditions or environmental events, could enhance the robustness of the findings. This research advances understanding of consumer behavior in green hotels, showcasing the value of neuromarketing in uncovering subconscious decision-

making factors. The findings have both theoretical and practical implications, providing a foundation for future research and actionable insights for the hospitality industry to further develop its green initiatives.

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Appendix A. Advertisement calling for participants