How do online review valence and ratings interact with consumer-generated visuals?

评论效价和评分如何与消费者自制的视觉效果？

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Abstract

The growth of social media and technology has given online reviews more importance and popularity. Consumer-generated visuals (pictures and videos), together with words and numerical components, are increasingly being used in online reviews. However, more research is necessary to understand how these components interact. This study aims to examine the relationships between review valence, numerical ratings, and hotel booking intentions, and investigate the interactions between consumer-generated visuals and demographics on these relationships. An online questionnaire was used to collect data using a convenience sample of 418 customers from Oman. The proposed model was tested using Structural Equation Modelling. The results demonstrated that negative review valence, positive review valence, and rating usefulness are all significant predictors of hotel booking intentions. The results also show that young and female customers are more affected by review valence and rating usefulness. Consumer-generated visuals play a moderating role, where the relationships between hotel booking intentions and review valence and ratings are weaker when customers are attentive to visuals. The study's results underline the role of negative valence, rating usefulness and visuals, and offer theoretical and practical implications.

Keywords: Consumer-generated visual; hotel booking intention; online review; online rating; review valence; user-generated content.

摘要

社交媒体和技术发展使线上评论日趋普及。线上评论因以消费者为本，视觉效果的组件越来越多，有图片、视频、文字和数字。值得研究的是這些組件的互動情況和產生的作用。本文旨在探討评论效价、数字评分和酒店预订意图之间的关系，以及调查消费者自制的视觉效果和人口统计数据在这些关系上的相互作用。本文使用线上的问卷调查，是来自阿曼的 418 名客户的便利样本所收集的数据，得到數據後本文進一步使用结构方程建模对所提出的模型进行测试。结果表明，评论效价的正負值面、评分高低值都是酒店预订意向的重要决定因素。结果还表明，年轻和女性客户更受评论效价和评级分数的影响。此外本文注意到消费者自制的视觉效果起到调节作用：当客户关注视觉效果时，酒店预订意图与评论效价和评分之间的关系较弱。本文研究结果突顯负效价、评级有用性和视觉效果的作用。同時為這些組件影響消費者之層面提供了理據和实践方向。

关键词：消费者自制的视觉；酒店预订意向；线上评论；线上评分；审查价；用户自制内容。

1. Introduction

"Rooms do not match photos of the rooms on the website... The room was a Deluxe

King bedroom and on the hotel website, it had a king bed and a day bed. However,

when we arrived, we found that the room did not have a day bed and did not match

the photo at all…" (TK_AUS, 2022).

This online review from TripAdvisor emphasizes the role of visuals (i.e., photos) in shaping customer expectations and satisfaction. Review platforms, such as TripAdvisor, Expedia, and Yelp, provide customers with a tool to evaluate their travel, accommodation, and dining experiences in a user-friendly setting. The boom in social media and photo-capturing technology, such as smartphones, also allows users to include photos and videos of their post-purchase or consumption experiences. This study argues that consumer-generated visuals play an important role in shaping customers' hotel booking intentions.

Customers are increasingly looking for information on the internet before making purchase decisions (Chocarro et ., 2021; Espigares-Jurado et al., 2020; Tan and Chen, 2012). Information about the quality of products and services is offered by businesses, such as hotels, in both descriptive and visual formats (Kim et al., 2021). However, the power has shifted to the experiences and reviews shared by customers on various social media platforms (Kapoor et al., 2021), which are considered more reliable than company-generated content (Casaló et al., 2015).

Online reviews can be described as consumer-generated content that evaluates a product, service, or experience and is shared with and accessed by others on a review site. They can be positive, negative, or mixed (Sharifi, 2019). While positive reviews increase consumer trust and, in turn, hotel booking intentions (Danish et al., 2019), negative reviews can have an undesirable effect on hotel sales and reservations (Shahid et al.,

2019). Online reviews come in written (words), numerical (rating), and visual (photos and videos) forms, or in combinations of all three. The *valence* of online reviews reflects the general tone, either positive, negative, or neutral (Sparks and Browning, 2011; Syafganti and Walrave, 2021). Customers also use numerical ratings (i.e., average star rating) as a heuristic to make decisions (Gavilan et al., 2018). In addition, visuals are taking an important place in online reviews (Zhang et al., 2022), and can influence buying intentions (Zhang and Wang, 2021).

In hospitality and tourism, customers are increasingly checking online reviews before booking a hotel or planning a trip. Many researchers have examined the role of online reviews in the hospitality industry (e.g., Assaker, 2020; Sparks and Browning, 2011; Zhang et al., 2022). However, three limits are of interest to the current study. First, prior studies have shown mixed results; while some studies have supported the primacy of positive reviews (e.g., Syafganti and Walrave, 2021; Zhong et al. 2014), others have supported the primacy of negative reviews in determining hotel booking intentions (e.g., El-Said, 2020; Zhao et al., 2015). This divergence warrants further investigation.

Second, online reviews, such as "*rooms did not match the photos at all,*" "*pictures are deceiving,*" or "*the room is exactly as appears in the photos*" underline the increasing importance of visuals. Visuals can provide evidence for the review message and, more importantly, they can stimulate genuine insights and positive customer perceptions (Ma et al., 2018). Providing photos of different facilities on hotel booking websites can boost positive reviews (Kim et al., 2021). Purchase intentions are also higher when reviews have photos, regardless of review length (Zinko et al., 2020). Interestingly, consumer-generated photos are more important for lower-priced hotels and for negative online reviews (Li et al., 2021). However, little is known, so far, about how consumer-generated

visuals interact with online review valence and ratings in shaping hotel booking intentions.

Third, age and gender have been widely investigated in consumer behavior research (Elhoushy and Lanzini, 2021; Khan et al., 2020). Yet, their effects are not conclusive in the context of online reviews. For example, Kim et al. (2011) found significant gender-based differences in consumer motivations to read and use online reviews. Assaker (2020) attributed the differences to gender roles and social theory, claiming that males are more task-oriented and care more about the usefulness of the reviews, while females are more risk-averse and value ease of use, reviewer expertise, and reviewer trustworthiness. Sparks and Browning (2011), however, found no significant differences in consumer perceptions of trust in online reviews and booking intentions based on age and gender. This discrepancy warrants further research while considering the different elements (i.e., valence, rating, and visuals) of online reviews.

To address the above limits, this study is guided by a key question: *how do online review elements interact, and to what extent do these interactions shape consumer booking intentions*? Precisely, the study's objectives are four-fold: (1) to examine the relationships between online review valence (both positive and negative) and hotel booking intentions; (2) to examine the relationship between numerical rating usefulness and hotel booking intentions; (3) to examine how visuals interact with review valence and rating in shaping hotel booking intentions; and (4) to examine the moderating effect of age, and gender.

To this end, the current study makes two contributions to the literature. First, this is the first study that examines the interactions between the different review elements (i.e., valence, rating, and visuals) and consumers' hotel booking intentions. Our study reveals how consumer-generated visuals moderate the relationships between hotel

booking intentions and positive review valence, negative review valence, and numerical rating usefulness. Second, this study extends the discussion on the role of demographics in the relationships between online review elements and hotel booking intentions (Zhang et al., 2022; Sparks and Browning, 2011; Assaker, 2020). Just as important, this study further discusses implications based on the results and suggests that hotels need to find ways of exposing customers to reviews with consistent written and visual elements to support online booking.

2. Theoretical foundation and hypotheses development

2.1. Theoretical foundation

The way consumers process online reviews is similar to the way they process information in general. Two theories that provide bases for information processing are the Heuristics-Systematic Model (Chaiken, 1980) and Elaboration Likelihood Model (Petty and Cacioppo, 1986). These models provide similar routes to explain information processing strategies: systematic and heuristic. The *systematic route* implies that consumers use high cognitive effort to process information (Zhang et al., 2014). For example, customers may judge the quality of the review and evaluate message persuasiveness using systematic factors, such as the negativity, consistency, and strength of the argument (Chou, et al. 2022; Xiao et al., 2018). The *heuristic route* suggests that consumers adopt heuristic and simple decision rules to quickly form judgments. Using the heuristic route, consumers use heuristic cues, such as numerical ratings, source identity, and reviewer expertise to build an intuitive conclusion (Chung et al., 2017).

Empirically, both systematic and heuristic factors influence customer purchase intentions (Zhang et al., 2014). Yet, the literature shows mixed results regarding the primacy of positive and negative reviews. Some studies emphasize the role of positive reviews (Zhong et al. 2014; Syafganti and Walrave, 2021). For example, Sparks and

Browning (2011) found that hotel booking intentions and trust are increased with positive, rather than negative, valence. Another line of studies considers negative reviews to be more important in shaping consumer behavior (e.g., Bae and Lee, 2011; Zhao et al., 2015). Interestingly, the presence of both negative and positive reviews can improve credibility, while positive reviews alone can undermine trustworthiness (Jha and Shah, 2021). Moreover, Amin et al. (2021) found that online reviews are not significantly related to hotel booking intentions, while visuals play a significant role in shaping booking intentions, ease of use, and perceived usefulness. This contradiction necessitates further investigation to clarify the role of positive and negative review valence, rating usefulness, and visuals. Table 1 provides a summary of prior studies and hypotheses are discussed in the next section.

Insert Table 1 Here

2.2. Hypotheses development

Figure 1 depicts the proposed model. The dependent variable –hotel booking intention, which reflects customer readiness to book a hotel while considering online reviews– is a function of three predictors: *positive review valence*, *negative review valence,* and *numerical rating usefulness*. Additionally, consumer-generated visuals, age, and gender are presumed to moderate the main relationships.

Insert Figure 1 Here

2.2.1. Positive review valence and hotel booking intentions

Review valence is defined as the general tone of the content of a customer review (Sparks and Browning, 2011), or the overall positive or negative evaluation of a hotel experience (Syafganti and Walrave, 2021). An online review conveys positive valence

when it shares genuine and pleasant content (e.g., positive comments) about the experience (Purnawirawan et al., 2012). That is, a reviewer can disseminate pleasant feelings to the reader by sharing positive words or photos that describe his/her joyful experience. However, prior results show that the impact of positive reviews on hotel booking is not conclusive. While some studies found that positive reviews (or valence) play a non-significant role in shaping hotel booking intentions (e.g., El-Said 2020, Zhao et al., 2015), other studies showed that positive online reviews are more significantly related to customer attitudes than negative reviews (e.g., Zhong et al., 2014). Likewise, positive review valence leads to greater booking intentions than negative review valence (Syafganti and Walrave, 2021). This might be because positive valence and the volume of reviews reduces the uncertainty and risk associated with online booking (Chen and Xie, 2008). Accordingly, in this study, consumers are expected to show stronger hotel booking intentions when they perceive positive valence from, and attach a higher value to, positive reviews. Thus, the following hypothesis is proposed:

H1: Online reviews that convey positive valence are significantly and positively related to customers' hotel booking intentions.

2.2.2. Negative review valence and hotel booking intentions

Negative valence is present when review elements contain criticisms, complaints, or dissatisfaction (Purnawirawan et al., 2012). That is, the online review transmits a negative experience to the reader through words, photos, or ratings. Empirical evidence supports the undesirable effect of negative reviews on hotel performance (Xie et al., 2014) and hotel booking intentions (Sparks and Browning, 2011). Compared to positive reviews, Avant (2013) found that negative online reviews on TripAdvisor had a stronger influence on customer actions. Similarly, Zhao et al. (2015) showed that negative online reviews significantly influenced consumer actions when compared to positive reviews.

Moreover, El-Said (2020) found that negative review valence is related to hotel booking intentions while positive valence is not statistically significant. This might be because negative information is assumed to have a greater effect due to its scarcity (Fiske, 1980). Also, humans tend to attach greater importance to negative things (Baumeister et al., 2001). Along these lines, it is expected that, the more value a consumer attaches to online reviews with negative valence, the stronger the relationship with their hotel booking intentions. Thus, the following hypothesis is proposed:

H2. Online reviews that convey negative valence are significantly and positively related to customers' hotel booking intentions.

2.2.3. Numerical rating usefulness and hotel booking intentions

Across various platforms, consumers are asked to rate their overall experience using a single numerical scale (Wu et al., 2011). Numerical ratings commonly take a scale from 1-5 or 1-10. This numerical rating is meant to summarize the overall experience and review content (Chevalier and Mayzlin, 2006). Ratings provide a heuristic to evaluate the product before deciding to buy and sometimes before reading the review (Siddiqi et al., 2020). In hospitality and tourism services, ratings are considered useful for customers because they provide easy-to-digest information provided by many previous tourists and travelers (Casaló, et al., 2015). They may also attract customer attention by offering a summary of reviews (Chua and Banerjee, 2014). Empirically, Sparks and Browning (2011) found that the presence of numerical ratings did not affect booking intentions. Other studies found that higher customer ratings boosted hotel booking intentions and hotel revenues (e.g., Öğüt and Taş, 2012). Taken together, in this study, it is expected that customers who perceive higher usefulness from, and attach a higher value to, numerical ratings are expected to have stronger hotel booking intentions. Thus, the following hypothesis is proposed:

H3. Numerical rating usefulness and customers' hotel booking intentions are significantly and positively related.

2.2.4. The moderating effect of consumer-generated visuals

Consumer-generated visuals refer to photos and/or videos that accompany written comments or ratings in online reviews. Online reviews that include visuals are considered more useful than text-only reviews (Li et al., 2021). They are more likely to become '*key online reviews*' that exert a strong impact on hotel booking (Zhang et al., 2022). This may be because consumer-generated photos attract greater attention than written messages and contribute to building a first impression (Zhang et al., 2022; Espigares-Jurado et al., 2020). Furthermore, visual information optimizes the credibility and quality of the offering and can raise the mental imagery regarding a product or service leading to positive customer attitudes (Kim et al., 2021; Lurie and Mason, 2007).

Combining both comments and visuals in an online review can boost its usefulness (Ma et al., 2018). Importantly, however, the consistency between review elements is crucial (An et al., 2020). If, for example, the comment is positive while the photos carry negative cues, this can reduce the review's usefulness and consumer trust. Accordingly, this study proposes that visuals moderate the relationships between review valence and ratings on hotel booking intention. The interaction is *positive* when visuals are consistent with the review message and rating, while *negative* when they are not consistent. The logic behind this potential interaction is two-fold. First, the consistency of reviews is critical (Bai et al., 2022). Therefore, whether the valence is positive or negative, visuals can still moderate the potential impact on hotel booking intention (Zinko et al., 2020). Second, consumers consider reviews with insufficient information as negative (Xie et al., 2014). Since visuals can add to the content and level of comprehensiveness of the review, it is expected that visuals can moderate the review

valence and rating usefulness on hotel booking intention. Thus, the following hypothesis is proposed:

H4. There is a significant interaction between visuals and (a) positive review valence, (b) negative review valence, and (c) numerical rating usefulness on hotel booking intentions. That is, these relationships differ based on checking (vs. not checking) consumer-generated visuals.

2.2.5. The moderating role of gender

Male and females process information differently (Putrevu, 2001) and they show different shopping interests and behaviors (Choi and Park, 2017; Hasan, 2010). In the context of online reviews, ratings from females tend to be more negative than those from male customers (Alreck and Settle, 2002). Females are also more likely than males to consider rating usefulness as an important factor (Chang et al., 2019). Negative reviews have a more influential effect on female buying intentions (Bae and Lee, 2011). Similarly, exposure to mixed reviews is more influential on female customers than male ones (Zhang et al., 2014). In restaurant settings, females tend to focus on the review text, while males tend to focus on the review rating before booking (Zhang et al. 2018).

While Sparks and Browning (2011) found no significant gender-based differences in consumer perceptions of trust in online reviews and hotel booking intentions, the current study expects that the relationships between review valence and rating usefulness on hotel booking intention differs between genders. This can be attributed to social psychology and gender role results: men are more pragmatic and task-oriented (Ramkissoon and Nunkoo, 2012), and females are more risk-averse (Lynott and McCandless, 2000). Using similar logic, Assaker (2020) indicated that males' use of online reviews is motivated mainly by perceived usefulness, while ease of use was the

main motivator for females. Accordingly, in this study, the hotel booking intentions of male and female consumers are expected to vary because they process information differently and attach different values to positive and negative reviews. Thus:

H5. Gender moderates the relationships between hotel booking intentions and (a) positive review valence, (b) negative review valence, and (c) numerical rating usefulness, such that these relationships differ based on gender.

2.2.6. The moderating role of age

Age plays an important role in consumer research. Different age groups vary in cognitive, psychological, and behavioral responses (Khan et al., 2020). Age as a moderator has been examined in many studies, yet the results are not consistent. Sparks and Browning (2011) found no differences in hotel booking intentions across age groups. Assaker (2020) found 'ease of use' to be the key determinant for using online reviews among old people, and perceived usefulness to be more influential for young people. The current study expects that the relationships between review valence, rating usefulness, and hotel booking intention will be stronger for young (vs. older) customers. This can be attributed to the self-efficacy and experience effects (Assaker, 2020); while young customers are more open to learning and able to use new technologies, older customers tend to rely on their experience (Assaker, 2020). As such, lower experience by young customers motivates them to check the experiences of others. Furthermore, older customers have more emotional and maturity dominance than young individuals (Carstensen et al., 2011). Thus:

H6. Age moderates the relationships between hotel booking intentions and (a) positive review valence, (b) negative review valence, (c) numerical rating usefulness. That is, the relationships differ across young (vs. older) customers.

3. Methodology

3.1. Data collection

This study was conducted in the first half of 2021, during the COVID-19 pandemic. Therefore, data were gathered through an online survey to reduce the risk of virus exposure or transmission (Mohanty et al., 2020). Customers from Oman, who had made a recent online hotel booking (at most two years before data collection), represented the population of this study. Before data collection, four academic experts in survey design reviewed the survey and provided feedback on the language and understandability of the survey. Several phrases in the survey were slightly modified in response to these suggestions.

Both convenience and snowball sampling strategies were used. People who read and write online reviews form part of online communities (Chan et al., 2022). However, these communities are broad, widely distributed, and only share a single characteristic (i.e., reading and writing online reviews). Therefore, it is difficult to determine or access a sampling frame for this population. In such circumstances, Bell et al. (2019) highlighted the appropriateness of convenience and snowballing strategies. Accordingly, a web-based survey was developed using google forms. The final survey's URL link was shared with the researchers' followers on social media platforms, mainly Facebook and Instagram. In addition, respondents were asked to forward the survey link to others they knew who had recently stayed in a hotel.

An introduction explaining the study's objectives and confirming data confidentiality accompanied the survey link. After the introduction, an eligibility question was added, asking consumers if they had made an online hotel booking in the last two years, and those who answered no were excluded. A total of 418 valid surveys were collected and included in the final data analysis.

3.2. Measures

There were two main sections in the survey. Section 1 included demographic questions (e.g., gender, age, marital status, and nationality) and behavioral questions (e.g., commonly used platforms). In addition, a question was added in this section to determine the respondent's tendency to check the visuals posted by previous customers when booking a hotel or not. Section 2 included the latent constructs of the current study's model. The factor of positive review valence is defined as a person's tendency to look at reviews with a positive orientation (e.g., "I pay more attention to positive reviews"). The factor of negative review valence is defined as a person's tendency to look at reviews with a negative orientation (e.g., "An abundance of negative reviews will make you dislike a hotel"). Both the factors of positive review valence and negative review valence were measured using three-item scales adopted from El-Said (2020) and Zhao et al. (2015). The factor of numerical rating usefulness reflects the person's perceived helpfulness and value from those ratings (e.g., "The online hotel rating is useful for resolving doubts when booking a hotel"). The factor of hotel booking intention is defined as a person's tendency to consider online reviews before making a hotel booking (e.g., "I can rely on online reviews and ratings before I book a hotel"). Both the factors of numerical rating usefulness and hotel booking intention were measured using four-item scales adopted from Casaló et al. (2015), El-Said (2020), and Gavilan et al. (2018). All the items in the factors of positive review valence, negative review valence, numerical rating usefulness, and hotel booking intention were measured using a Likert scale (1= Strongly Disagree; 5= Strongly Agree).

3.3. Data analysis

Data were checked for issues that could affect the quality of the findings, such as normality, common method bias, and multicollinearity. To check the normality, the

skewness and kurtosis values were calculated. Both values were below the threshold of ±2 and ±7 respectively, confirming the normal distribution of the data (Hair et al., 2010). Likewise, the variance inflation factor (VIF) was calculated for each independent variable to check for multicollinearity. All VIFs were below the threshold of 3, demonstrating the absence of multicollinearity issues (O'brien 2007). Furthermore, because the data were obtained from respondents all at once, three steps were taken to decrease the threat of common method bias. First, an eligibility question at the beginning of the survey asked customers if they had booked a hotel online in the previous two years. Those who had not were excluded from the final analysis. Second, the study's goal and objectives were clearly stated in the introduction, pointing out that there were no right or wrong answers. Third, the common latent factor (CLF) test was used to test for common method bias (Podsakoff et al. 2003). Using AMOS 24, two Confirmatory Factor Analysis models were estimated, one of which had a common latent factor, and the other did not. The differences between the standardized regression weights of the two measurement models (with and without CLF) were calculated. All the calculated differences were below the threshold value of 0.20, confirming the absence of common method bias (Podsakoff et al. 2003).

After data screening, the further analyses were conducted in three stages. First, SPSS was used to perform the descriptive analysis and to calculate Cronbach's Alpha for all the constructs. Second, to test hypotheses 1 to 3, a Structural Equation Model (SEM) was tested through a two-stage process (Confirmatory Factor Analysis and assessment of the Structural Model) using AMOS 24, as recommended by Anderson and Gerbing (1988). Third, PROCESS macro (version 3.2), model 1, was used to measure hypotheses 4 to 6.

4. Results

4.1. Respondents' characteristics

The demographic profile of the respondents is shown in Table 2. Males made up 31.1% of the 418 responses, while females made up 68.9%. Respondents under the age of 22 represented 23.4% of the sample, 40.9% were between the ages of 23 and 33, 22% were between the ages of 34 and 44, and the remainder were over the age of 45. Concerning marital status, single respondents accounted for 63.4% of the total, while married respondents accounted for 35.6% of the sample. Regarding attention to reviews, about three-quarters of the respondents (73.2%) indicated that they paid attention to both positive and negative reviews, followed by those who just paid attention to negative reviews (15.3%), and, finally, those who paid attention to positive reviews only (10.8%). Most of the respondents (89.7%) indicated that they checked to see if reviews were supported with photos, whereas 10.3% of the respondents indicated that they did not. The majority of the respondents read online reviews on Booking.com (94.5%), followed by those who used TripAdvisor (29.4%), Instagram (23.9%), Twitter (7.2%), Facebook (2.9%), and other platforms or websites (2%).

Insert Table 2 Here

4.2. Measurement model

A Confirmatory Factor Analysis (CFA) was conducted to verify the validity and reliability of the constructs, and items with loadings of less than .6 were eliminated (Hair et al., 2010). Except for one item from the numerical rating usefulness construct, all the items met the threshold of .6, as indicated in Table 3. To increase confidence in the model's goodness of fit, previous researchers (e.g., Hair et al., 2010; Schumacker and

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Lomax, 2004) suggest using a combination of fit indices to demonstrate how well the model fits the observed data.

The results of the CFA demonstrated that the model provided an acceptable fit to the data. First, Normed Chi-Square (χ^2/df) values of <3 are considered acceptable, whereas >3 to <5 denotes a reasonable fit (Marsch and Hocevar, 1985; Schumacker and Lomax, 2004), hence the model's value (χ^2=224.514, df=57, P <.001, χ^2/df=3.939) was in line with the accepted criteria. Similarly, other goodness of fit indices were in line with the accepted criteria (Goodness-of-Fit Index (GFI)= 0.924, Comparative Fit Index (CFI)= 0.950, Tucker Lewis Index (TLI)= 0.932, Root Mean Square Error of Approximation (RMSEA)= 0.08).

In addition, indicators of construct validity and reliability were calculated as shown in Tables 3 and 4. For each construct, Cronbach's alpha (α) and Composite Reliability (CR) were over the threshold of .7, suggesting satisfactory construct reliability (Campbell and Fiske, 1959). Furthermore, each construct's AVE was greater than the criterion of .5, indicating that the constructs were convergent (Fornell and Larcker, 1981). Furthermore, each construct's square root of the AVE was larger than its correlation with other constructs, indicating discriminant validity (Hair et al., 2010; Fornell and Larcker, 1981).

Insert Table 3 Here

Insert Table 4 Here

4.3. Results of the structural model

The structural equation model indicated a good fit to the data (χ^2=225.922, df=54, P <.001, χ^2/df= 4.184, GFI= 0.925, CFI= 0.949, TLI= 0.927, RMSEA= 0.08).

Table 5 presents the findings of the structural model. The three independent variables predict 69.4% of the variance in hotel booking intentions. Positive review

valence is significantly and positively related to hotel booking intention (β = .186, P < .001), indicating that H1 is supported. Negative review valence is significantly and positively related to hotel booking intention (β = .498, P < .001), thus H2 is supported. Numerical rating usefulness is significantly and positively related to hotel booking intention (β = .291, P < .001), indicating that H3 is supported.

Insert Table 5 Here

4.4. The moderating effects

4.4.1. The moderating effect of consumer-generated visuals

Consumer-generated visuals significantly moderate the relationship between positive review valence and hotel booking intention (R^2- chng = .0208, F = 12.0229, p < .001). Figure 2.a depicts this effect and shows that hotel booking intentions are stronger for customers who do not check visuals (b = .7905, t = 7.0383, p < .001) than those who check them (b = .3790, t = 9.8798, p < .001). Thus, H4a is supported. Visuals also moderate the relationship between negative review valence and hotel booking intention (R^2-chng = .0069, F = 5.2378, p < .003). Figure 2.b shows that the impact of negative review valence on hotel booking intention is stronger for consumers who do not check the visuals (b = .7386, t = 9.3111, p < .001) compared to those who check them (b = .5404, t = 15.5111, p < .001). Thus, H4b is supported. The effect of consumer generated visuals also moderates the relationship between numerical rating usefulness and hotel booking intention (R^2-chng = .0118, F = 7.9840, p < .005). Figure 2.c shows that the impact of numerical rating usefulness on hotel booking intention is stronger for individuals who do not check visuals (b = .7382, t = 8.9528, p < .001) compared to those who check the visuals (b = .4822, t = 12.8283, p < .001). Thus, H4c is supported.

Insert Table 6 Here

Insert Figure 2 Here

4.4.2. The moderating effect of gender

The results reveal that gender has a strong moderating effect on the relationship between positive review valence and hotel booking intention (R^2- chng = .0170, f = 9.6463, p < .001). Figure 3.a shows that the impact of positive review valence on hotel booking intention is stronger for female customers (b = .4993, t = 11.7681, p < .001) than male customers (b = .2389, t = 3.3032, p < .001). Thus, H5a is supported. Similarly, the relationship between negative review valence and booking intention is moderated by gender (R^2- chng = .0151, F = 11.6985, p < .001). Figure 3.b shows that the slope is stronger for female customers (b = .6307, t = 18.0779, p < .001) compared to male customers (b = .3626, t = 5.1652, p < .001). Thus, H5b is supported. Gender also moderates the relationship between rating usefulness and hotel booking intention (R^2-chng = .0152, F = 10.1151, p < .001). Figure 3.c shows that the slope is stronger for female customers (b = .5893, t = 15.0337, p < .001) compared to male customers (b = .3255, t = 4.4539, p < .001). Thus, H5c is supported.

Insert Table 7 Here

Insert Figure 3 Here

4.4.3. The moderating effect of age

The respondents were grouped into three different age categories: less than 24, 24-45 and 45 and above. The results show that age moderates the relationship between positive review valence and hotel booking intention (R^2-chng = .0256, F = 7.3869, p < .001). As Figure 4.a demonstrates, the relationship is stronger for young consumers aged 24 or less (b = .6460, t = 8.6566, p < .001), followed by the 24-45 age group (b = .4059, t = 8.7153, p < .001), and then the 45 and above age group (b = .2029, t = 2.2127, p <

.005). Thus, H6a is supported. Age also moderates the impact of negative review valence on hotel booking intention (R^2-chng = .0140, F = 5.4315, p < .001). Figure 4.b shows that the effect is stronger for young customers aged 24 or less (b = .6912, t = 13.9579, p < .001), followed by those in the 24-45 age range (b = .5201, t = 12.0678, p < .001), and then the 45 and above age group (b = .3597, t = 3.2303, p < .001). Thus, H6b is supported. Lastly, age significantly moderates the relationship between rating usefulness and hotel booking intention (R^2-chng = .0168, F = 5.6299, p < .005). As Figure 4.c shows, the strongest impact is for young customers aged 24 or less (b = .6964, t = 11.4852, p < .001), followed by those in the 24-45 years age group (b = .4527, t = 9.5082, p < .001), while the 45 and above age group experienced the lowest impact (b = .4362, t = 4.8745, p < .001). Thus, H6c is supported.

Insert Table 8 Here

Insert Figure 4 Here

5. Discussion

The current study demonstrates the influence of positive review valence on hotel booking intention. This means that the more a consumer pays attention to positive reviews, the more they will rely on online reviews in their hotel booking decisions, and vice versa. It is interesting to note that, of the three predictor variables in the model of the current study, positive review valence has the weakest effect on hotel booking intentions. This finding reinforces the work of Zhong et al. (2014), who drew attention to the influence of positive review valence on customer attitudes, and the work of Syafganti and Walrave (2021), who linked positive review valence to greater booking intention. However, it contrasts with the studies of El-Said (2020) and Zhao et al. (2015), who did not find a significant relationship between positive review valence and hotel booking intention.

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Negative review valence also exhibits an influence on hotel booking intention in the current study. This means that the more a consumer pays attention to negative reviews, the more they will rely on online reviews in their hotel booking decisions, and vice versa. In the model of the current study, negative review valence has the strongest effect on hotel booking intentions. While this is consistent with previous research (e.g., Avant, 2013; Xie et al., 2014), it contradicts the findings of Mauri and Minazzi (2013), who found that positive reviews on TripAdvisor had a stronger influence on hotel booking intentions than negative reviews. Moreover, the finding agrees with previous literature that highlighted the influence of negative review valence on hotel performance (Xie et al., 2014), consumer actions (e.g., Avant, 2013; Zhao et al., 2015), and, especially, hotel booking intentions (e.g., El-Said, 2020; Sparks and Browning, 2011). Furthermore, the current study's findings on the influence of positive and negative reviews confirm those of Chan et al. (2017), who similarly found that online review valence affected hotel booking intention.

Numerical rating usefulness also displays an effect on hotel booking intention in the current study. This means that the more a consumer finds online ratings useful, the more they will rely on online reviews in their hotel booking decisions, and vice versa. Numerical rating usefulness has the second strongest effect on hotel booking intentions among the three predictor variables in the model of the current study. This finding supports those of Öğüt and Taş (2012), who similarly discussed the relationship between numerical ratings and hotel booking intentions. Furthermore, it provides support for Casaló et al.'s (2015) statement about the usefulness of numerical ratings in hospitality and tourism service contexts. However, the finding contradicts those of Sparks and Browning (2011), who found that hotel booking intentions were unaffected by numerical ratings.

Consumer generated visuals demonstrate a moderating effect on the relationships between the three predictor variables and hotel booking intention. Specifically, consumer generated visuals have a disordinal interaction effect on the relationships between positive review valence and hotel booking intention, and between negative review valence and hotel booking intention. Individuals who pay little attention to positive or negative reviews will rely more on online reviews in their hotel booking decisions if they check consumer generated visuals. However, consumers who pay more attention to positive or negative reviews will rely less on online reviews in their hotel booking decisions if they check consumer generated visuals. Differently, consumer generated visuals have an ordinal interaction effect on the relationship between numerical rating usefulness and hotel booking intention. In other words, consumers who check consumer generated visuals will be more likely to rely on online reviews in their booking decisions, whether they pay attention to reviews (either positive or negative) or not. This finding complements the work of previous researchers (e.g., Kim et al., 2021; Li et al., 2021; Lurie and Mason, 2007; Ma et al., 2018), who drew attention to the usefulness of visuals in online reviews, and the studies of An et al. (2020) and Espigares-Jurado et al. (2020), who discussed the attractiveness of consumer generated visuals in online reviews. Furthermore, the finding provides strong evidence for Zhang et al.'s (2022) predictions on the importance of consumer generated visuals for hotel booking intentions.

Similarly, the study's findings support the moderating effect of gender in the relationships between the three predictor variables and hotel booking intention. For all three relationships, there was a disordinal interaction effect. Put simply, among consumers who pay less attention to negative reviews, positive reviews, or rating usefulness, males rely more on online reviews in their hotel booking decisions than females do. Yet, among consumers who pay more attention to negative reviews, positive

reviews, or rating usefulness, males rely less on online reviews in their hotel booking decisions than females do. This finding reinforces Choi and Park's (2017) and Hasan's (2010) statements about the difference in shopping behaviors between males and females. Furthermore, it agrees with Zhang et al. (2018), who identified significant differences in the way that males and females used online reviews. However, it disagrees with the work of Sparks and Browning (2011), who found no significant variation in the trust that males and females had for online reviews when making their hotel booking decisions. Additionally, the finding builds on and adds new dimensions to, the work of previous researchers. Bae and Lee (2011) and Chang et al. (2019) found that females were more likely to refer to negative reviews and numerical ratings than males. Now, the current study reveals that this is only the case among consumers who already exhibit high levels of negative review valence and rating usefulness. Lien et al. (2015) found that there was no difference in the way that brand image, price, trust, and perceived value influenced male and female online hotel booking intentions. Ultimately, the current study underlines that the influence of online reviews and ratings on hotel booking intentions varies between males and females.

In addition, the current study highlights the moderating effect of age in the relationships between the three predictor variables and hotel booking intention. Concerning positive review valence and negative review valence, there is an ordinal interaction effect. For consumers who pay little attention to positive or negative reviews, younger people (i.e., less than 24 years old) rely less on online reviews in their hotel booking decisions than older people do (i.e., 24 years old and above). However, among consumers who pay more attention to positive or negative reviews, younger people (i.e., less than 45 years old) rely more on online reviews in their hotel booking decisions than older people do (i.e., above 45 years old). The effect is more consolidating for numerical

rating usefulness. In this regard, among consumers who do not find ratings to be useful, younger people (i.e., less than 24 years old) rely less on online reviews in their hotel booking decisions than older people do (i.e., 24 years old and above). Yet, among consumers who find numerical ratings to be useful, all age groups display a nearly identical reliance on online reviews in their hotel booking decisions. This finding reinforces Khan et al.'s (2020) statement about age playing a role in consumer behavioral responses. However, it contrasts with Sparks and Browning's (2011) study, which found no variation in hotel booking intention based on consumer age groups. The finding, again, adds new dimensions to previous research. Especially that of Assaker (2020) who discuss the openness of younger people to use new technologies and the tendency of older people to rely on their own experiences. Taken together, the current study reveals that it is older people who are more open to using technology among consumers with high levels of positive review valence and negative review valence. Moreover, the current study highlights how older people have the same openness to using technology as younger people among consumers with high rating usefulness. A summary of the current study's findings compared to previous research is displayed in Table 9.

Insert Table 9 Here

6. Theoretical implications

With respect to Petty and Cacioppo's (1986) model, an individual who reviews the experiences of previous customers before making a purchase is someone who processes a purchase decision with a high degree of elaboration. Concerning Chaiken's (1980) model, an individual who reads reviews to understand the reviewer's main arguments before making a purchase is engaged in a high degree of cognitive processing. In other words, they are using systematic processing to form an attitude about that purchase. In the current study, this is represented by the relationships of positive review

valence and negative review valence on hotel booking intention. That is to say, the individual is dedicating a considerable amount of energy in sifting through the reviews to identify the things that other people liked and disliked about the hotel. Numerical ratings, on the other hand, summarize experiences into widely applicable categories that are often aggregated together into an average score. As an individual can quickly understand and compare these without much effort, reading ratings can be appreciated as a process that is based on judgmental rules and requires less elaboration. To put it simply, an individual who relies on ratings for a purchase decision is using the heuristic processing. In the current study, this is represented by numerical rating usefulness. Instead of sifting through each review, they are looking for a quick and familiar way to form an attitude about the hotel they want to book.

Consumer generated visuals also offer potential customers a comparatively effortless way of forming an attitude about a hotel. As the viewer can easily compare these visuals to their needs and expectations, there is less need for them to read the review text, or even look for other sources of information (e.g., social media pages, official websites, etc.). This would explain the moderating effect of consumer generated visuals. Among consumers with low positive and negative review valence, those who refer to consumer generated visuals have a higher intention to use online reviews in their hotel booking decisions. This is because they are more heuristic decision makers, who are looking for less elaborative and more familiar ways to form an attitude about a hotel. Among consumers with high positive and negative review valence, those who refer to consumer generated visuals have a lower intention to use online reviews in their hotel booking decisions. This is because they are more systematic decision makers and are looking for more elaborative ways to form an attitude from more credible sources (by reviewing the review text for example).

Curiously, consumer generated visuals increase hotel booking intention for consumers with both low and high rating usefulness. A fitting interpretation for this result can be found in previous research (e.g., Espigares-Jurado et al., 2020; Kim et al., 2021; Li et al. 2021; Lurie and Mason, 2007; Zhang et al. 2022), which suggested that visual reviews were likely to exert a strong influence on consumers' hotel booking decisions because they build first impressions. Along these lines, it can be appreciated that consumers go through a screening process when looking for a suitable hotel. At first, all consumers look for heuristic cues to identify an appropriate collection of hotels. At this stage, consumer generated visuals complement numerical ratings allowing an individual to quickly identify the hotel properties that match their needs and expectations. Then, consumers will look for the most appropriate hotel in this collection based on their decision-making processes. Systematic decision makers will go through the positive or negative reviews and heuristic decision-makers will use judgmental rules to select a single hotel to book.

Based on the results of the current study, it is possible to understand how consumers of different genders and ages develop attitudes about making hotel bookings. As the effect of positive review valence, negative review valence, and rating usefulness is stronger for females than males (i.e., the difference between low and high is greater), it can be appreciated that females are more systematic decision makers and males are more heuristic decision makers. That is to say, female attitudes about booking a hotel are more greatly affected by these three sources of information, whereas men may rely more on other cues or judgements about the hotel (e.g., star rating, brand, etc.). This interpretation aligns well with previous research (e.g., Zhang et al., 2014; Zhang et al., 2018) which suggests that women are more concerned with the details of their stay, and, therefore, pay greater attention to the content of online reviews. Likewise, as the

moderating effect of positive review valence, negative review valence, and rating usefulness is stronger for younger people (i.e., the difference between low and high is greater), it can be appreciated that younger people are more systematic decision makers than older people, who may, rather, rely on other cues for their hotel booking decisions.

7. Practical implications

For hotel managers, online reviews should be treated as sales opportunities, as channels to convince potential customers to make a booking. Once a customer decides to refer to online reviews, managers can apply various interventions (e.g., engaging with reviewers, compensating dissatisfied reviewers, correcting service failures, etc.) to foster a favorable attitude towards the hotel and making a booking. Yet, before these interventions can be applied, potential customers need to be persuaded into referring to online reviews when making their hotel booking decisions. The results of the current study offer several insights into the way that this might be achieved.

The volume of both positive and negative reviews influences an individual's tendency to refer to online reviews in their hotel booking decisions. Of the two, however, hotel managers tend to prioritize positive reviews and, often, strive to remove negative ones, despite negative reviews having a stronger influence on a person's behavior (possibly due to the fear that hotel managers manipulate or produce positive reviews themselves). Therefore, managers, who would like potential customers to refer to online reviews about their hotel, should not seek to suppress negative reviews. Rather they should try to maintain them, improve the viewer's perception of review credibility, and apply interventions that encourage potential customers to make a booking.

Rating usefulness also has a strong influence on an individual's tendency to refer to online reviews in their hotel booking decisions. Likely, this is because ratings are, essentially, a breakdown of a hotel's performance into broad categories that potential

customers can easily judge according to their personal needs and expectations. However, the attractiveness of these heuristic cues may be diminished if hotels and review websites use different or incompatible categories. Therefore, managers, who would like potential customers to view online reviews about their hotel, should apply numerical ratings to their official channels (e.g., websites and mobile apps), and should collaborate with review websites to align the rating categories that are used.

Consumer generated visuals increase the tendency to refer to online reviews among people who pay little attention to positive or negative reviews, and all those who use numerical ratings. This is because they provide quick and effortless cues that appeal to heuristic decision makers and enhance the heuristic cues offered by numerical ratings. Therefore, managers, who want to encourage potential customers to view online reviews about their hotel, should highlight consumer generated visuals on their channels. For example, having a dedicated gallery for guest generated photos and videos on the official website. Managers should also try to tie numerical ratings to guest generated visuals. This could be done by tagging guest generated visuals according to the numerical rating categories so that a potential customer can access related visuals by clicking on a link next to a numerical rating category.

However, among consumers who pay strong attention to positive or negative reviews, it is apparent that consumer generated visuals do not increase the intention to refer to online reviews in hotel booking decisions. This is because these consumers are systematic decision makers, interested in understanding the reasons why reviewers assigned positive or negative scores to their stay. Therefore, managers, who would like potential customers to refer to online reviews about their hotel, should look for ways to make online reviews appeal more to systematic decision makers. This could be done by making the navigation of online reviews more intuitive, by segmenting online reviews

into positive, negative, and neutral sections for example. A potentially more useful solution would be to rate the reviews themselves so that potential customers can quickly find the more detailed and valuable reviews and filter out the uninformative ones.

The effect of positive reviews, negative reviews, and numerical ratings is stronger for female consumers. This is because they tend to be more systematic decisions makers than men and need detailed information about a hotel before making a booking. Therefore, managers, who would like potential customers to view online reviews about their hotel, should enhance reviews and ratings to meet the needs of women. For example, instead of rating the overall experience in the room, allowing people to rate the décor, the bed comfort, and the noise. Along these lines, hotels could also invite social media personalities with predominantly female followers to stay at their hotels, as long as they complete a detailed review of their experience in a way that appeals to women. In much the same way, the effect of positive reviews, negative reviews, and numerical ratings is stronger for younger consumers. This is because they tend to be more systematic decision makers and need meaningful and reliable information about a hotel before making a booking. Therefore, managers, who would like potential customers to refer to online reviews about their hotel, should try to make their online reviews appeal to the needs of younger consumers. This could be done by segmenting reviews according to the reasons the writers stayed at the hotel. For example, those who booked the hotel for a vacation with friends, a conference, a wedding, and so on. Furthermore, special ratings could be devised that appeal to younger people, such as the quality of the entertainment systems and the range of dietary options (e.g., healthy food, vegan, responsible food, etc.) for example.

8. Limitations and directions for future research

This study has some limitations that can be investigated further in future research. First, the current study only focused on online reviews and ratings as predictors of hotel booking intentions. Future studies should investigate the impact of online reviews and ratings in conjunction with other factors, such as hotel location, price, and brand image. Second, only three moderators were investigated in the relationship between online reviews and ratings and hotel booking intentions. Other moderators, such as consumer experience with technology, time taken to read reviews, platform type, and trust perception, should be investigated in future studies. A third limitation stems from the way we looked at the impact of visual reviews and the fact that we only looked at whether customers paid attention to them or not. Given their significance, future research should examine their influence from a variety of perspectives, including the quantity and quality of uploaded photos and the duration of videos. A final limitation is related to the research model and the mechanism of how online reviews impact hotel booking intentions. Future studies might extend this model by adding mediators such as perceived credibility and authenticity of reviews.

9. Conclusion

This study revisited the links between online reviews and hotel booking intentions to understand the interactions between positive and negative review valence, numerical rating usefulness, consumer generated visuals, and demographics. Negative review valence exerts the strongest influence on hotel booking intention, followed by numerical rating usefulness, and positive review valence, respectively. Consumer generated visuals moderate these relationships, leading to higher hotel booking intentions among consumers with low positive review valence, low negative review valence, and for all consumers concerning numerical rating usefulness. However, consumer generated

visuals decrease hotel booking intention among consumers with high positive review valence and high negative review valence. Gender also moderates the influence of the predictors, such that females with low positive review valence, low negative review valence, and low numerical rating usefulness exhibit lower hotel booking intentions than males do. Yet, females with high positive review valence, negative review valence, and numerical rating usefulness exhibit higher hotel booking intentions than males. Likewise, age moderates the influence of the predictors, such that, among consumers with low positive review valence, negative review valence, and numerical rating usefulness, younger consumers display lower hotel booking intention than older consumers. Among consumers with high positive review valence and negative review valence, however, younger people display higher hotel booking intentions than older consumers.

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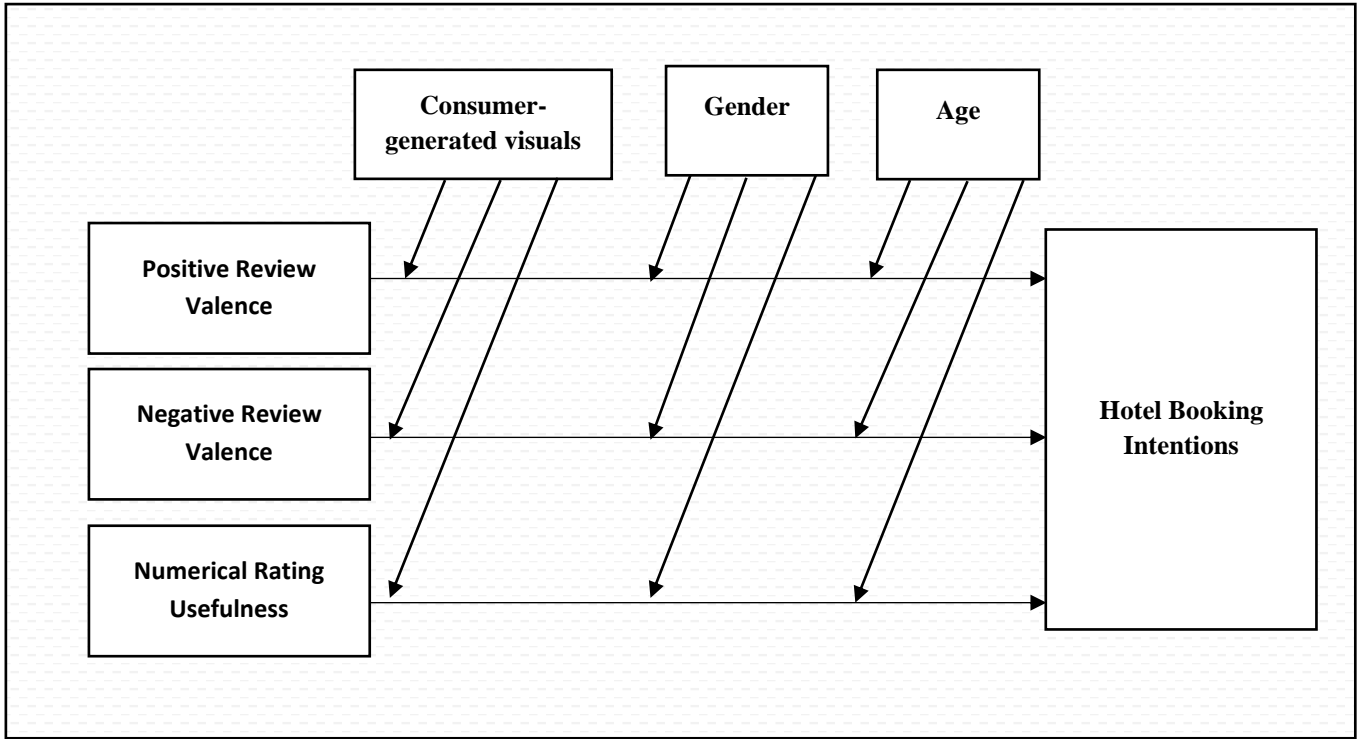
Figure 1. Online reviews and hotel booking intentions: the moderating role of consumer-generated visuals, gender, and age.
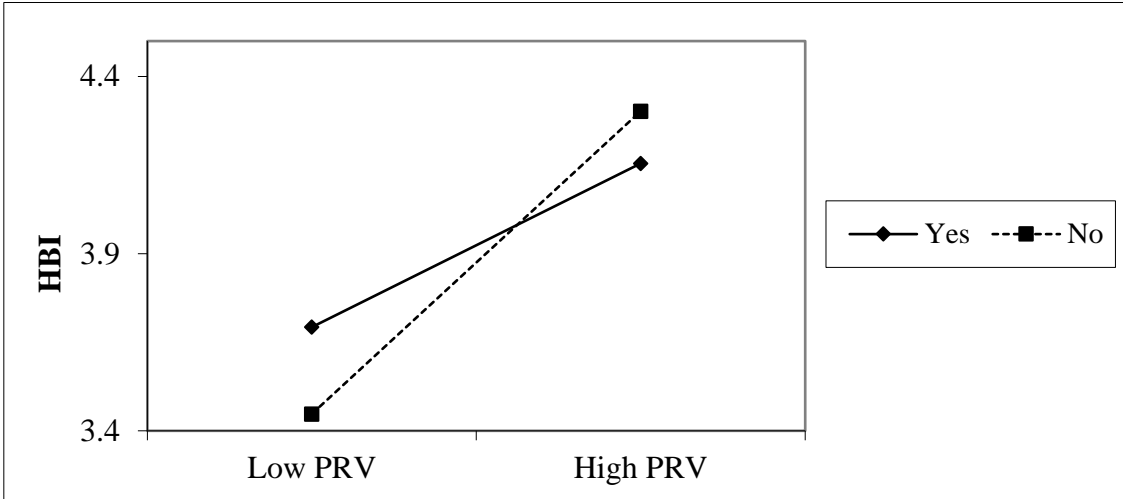
Figure 2.a. Simple Slope between PRV and HBI for consumer-generated visuals
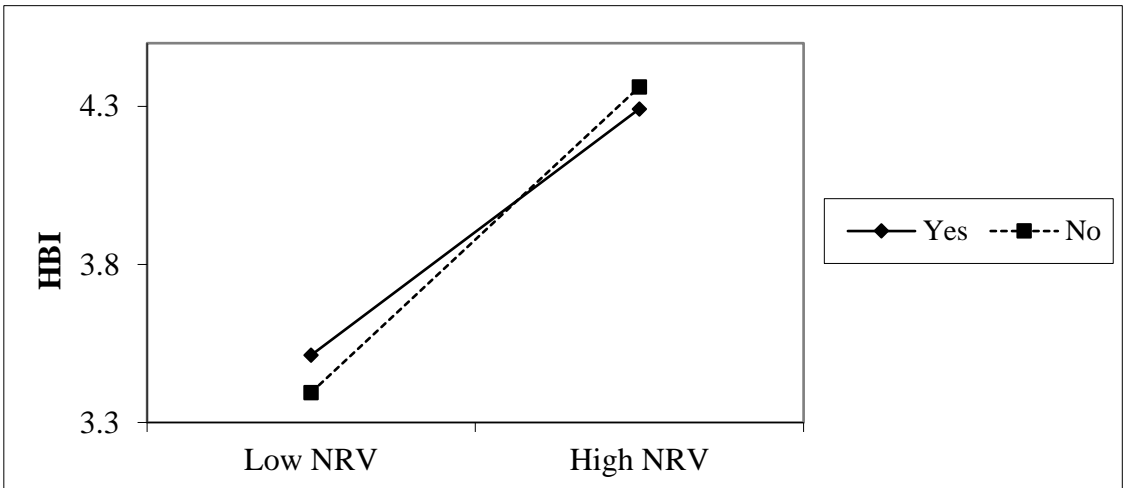
Figure 2.b. Simple Slope between NRV and HBI for consumer-generated visuals
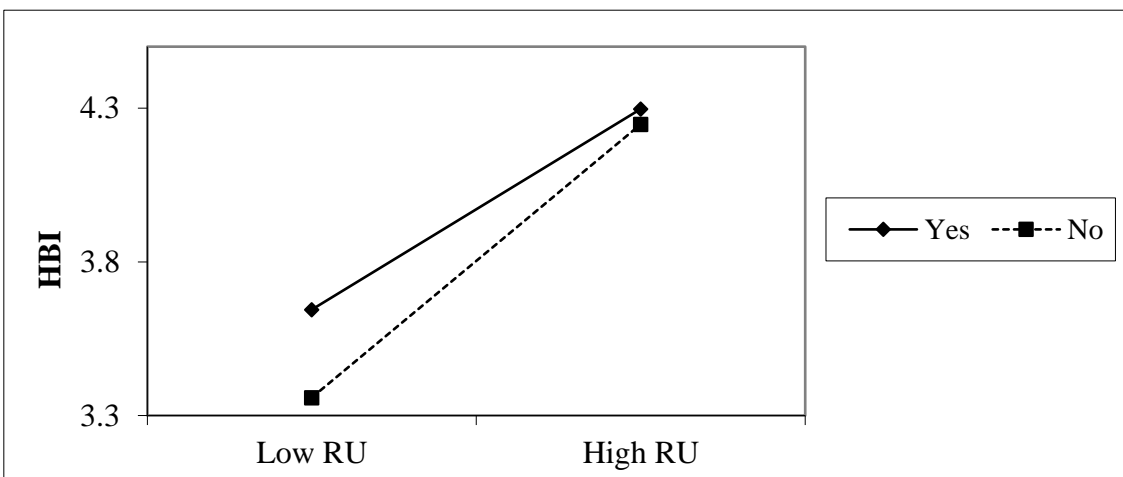
Figure 2.c. Simple Slope between RU and HBI for consumer-generated visuals
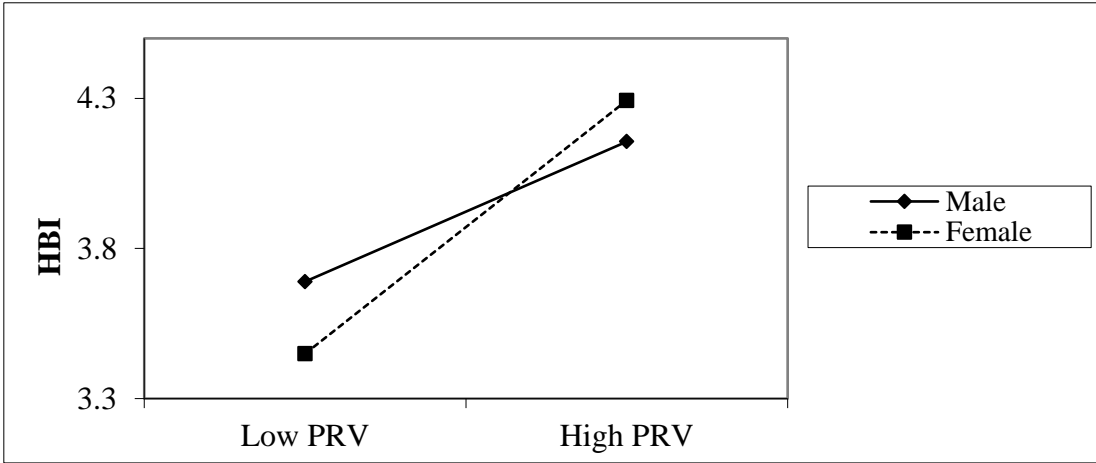
Figure 3.a. Simple Slope between PRV and HBI for Different Genders
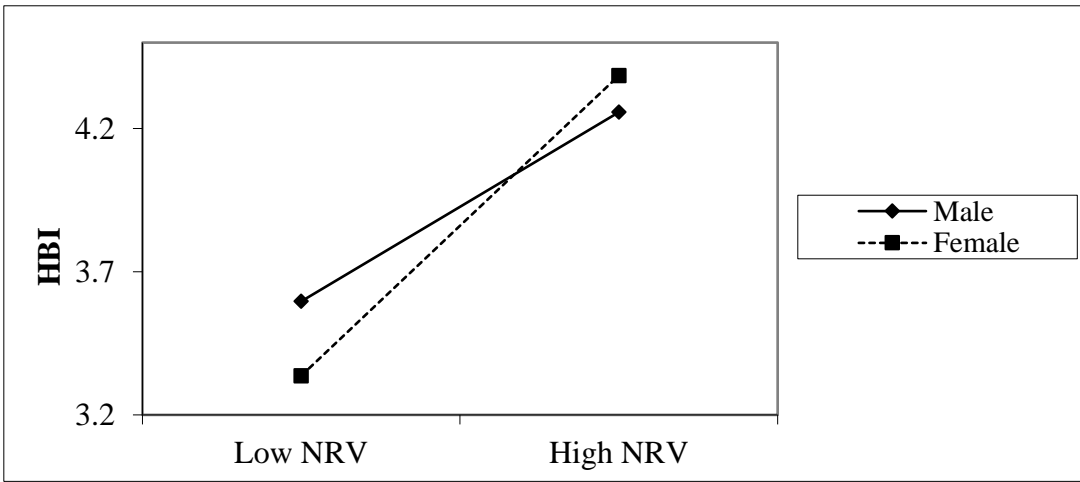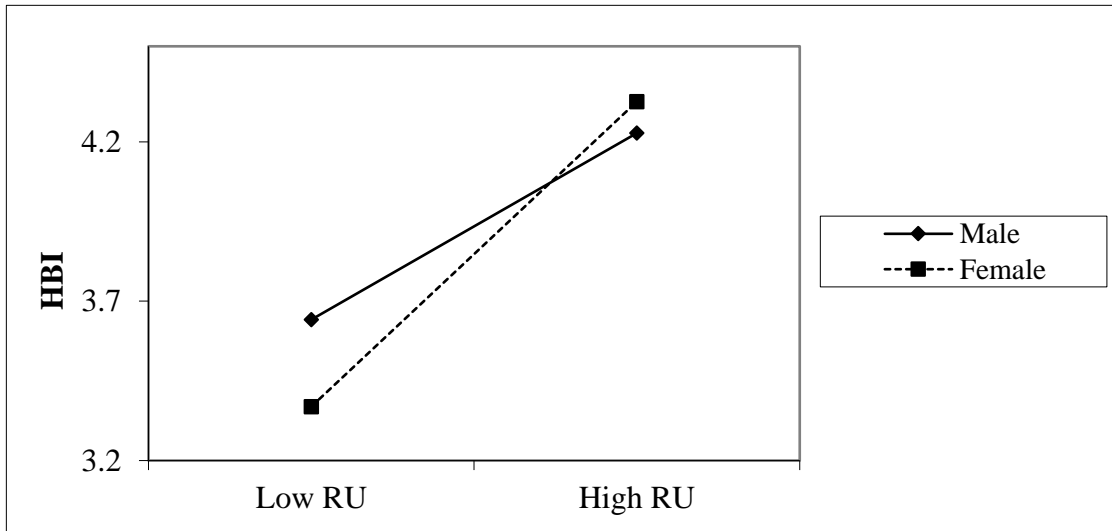

Figure 3.b. Simple Slope between NRV and HBI for Different Genders

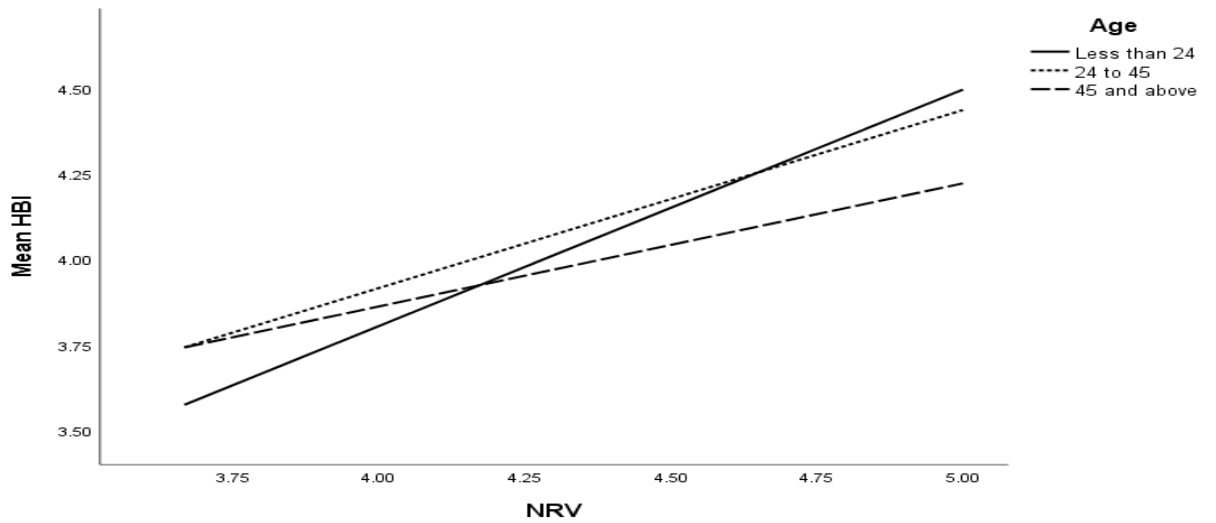Figure 3.c. Simple Slope between RU and HBI for Different Genders
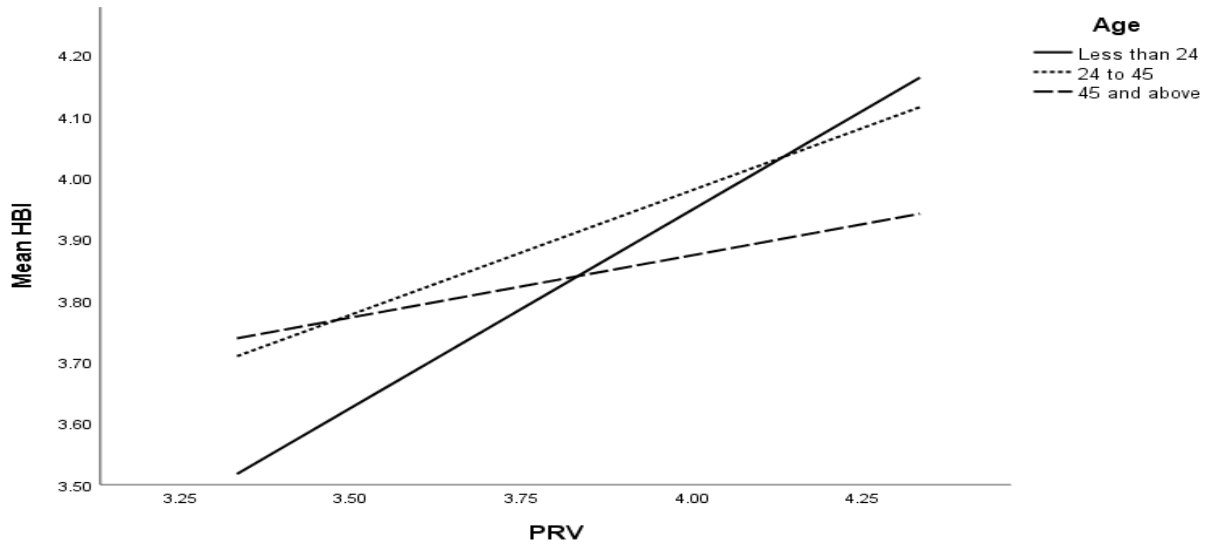
Figure 4.a. Simple Slope between PRV and HBI for Different Age Groups

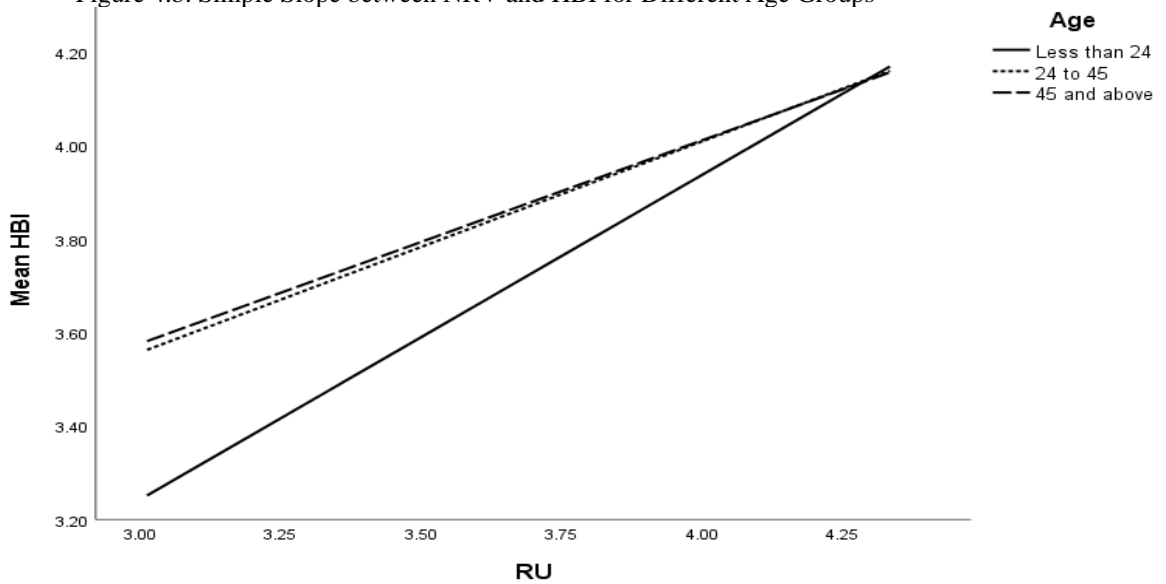Figure 4.b. Simple Slope between NRV and HBI for Different Age Groups

Figure 4.c. Simple Slope between RU and HBI for Different Age Groups

Table 1. Summary of previous studies' results

Author (year)	Sample and design	Theory	Key variables	Significant findings
Xia et al. (2022).	N= 182, China, online questionnaire	n/a	Quantity of review, review score, the content of the review, number of useful comments, the experience of reviewers, timeliness of reviewer	Out of six potential factors affecting booking decision-making, only three factors are important in the booking decision: quantity of review, the content of the review, and the number of useful comments.
Wang et al. (2022)	N= 100 restaurants, 75,782 restaurant reviews, of which 68,411 are authentic and 7,371 are fake reviews.	Interpersonal deception theory	Emotional cues, cognitive cues, review fakeness.	Emotional cues are positively related to review fakeness. That is reviews with a higher proportion of emotional words are more likely to be fake than authentic. Cognitive cues are not related to review fakeness. Thus, the dynamics of emotional cues and cognitive cues are salient among negative reviews.
Lee et al. (2022)	N= 43,000 online restaurant reviews analyzed by applying supervised Machine Learning algorithms	n/a	Fake review determinants for restaurants (review-related, reviewer-related, and linguistic attributes).	Time distance is revealed to be the most significant of the 16 review attributes, followed by two linguistic (affective and cognitive cues) and two review-related attributes (review depth and structure).
Zhang et al. (2022)	N = 551,600 online reviews of 650 hotels, China.	n/a	Key online reviews (KORs), online hotel booking, review length, review readability, reviewer experience, reviewer reputation, reviewer habit	Review depth, review readability, reviewer experience reviewer reputation, and review habit are important determinants of hotel booking. KORs play a complete mediation between hotel booking and reviewer reputation, while partially mediating the effect of review depth, review readability, reviewer experience, and reviewer habit on online hotel booking.
Amin et al. (2021)	N = 354, Malaysia (major), online questionnaire	Technology acceptance model	Perceived usefulness, perceived ease of use, booking intention, visual presentation, online reviews	Visual presentations and perceived usefulness are key predictors of booking intentions, while online reviews have a non-significant impact. Yet, online reviews and visual presentations have a positive impact on perceived usefulness and perceived ease of use.
Bai et al. (2022)	N = 141 (study 1) and 557 (study 2), online questionnaire	Accessibility-diagnosticity framework	Outcome satisfactory review, booking intentions, process satisfactory review. Review impression, perceived risk, review valence	The results indicate that outcome satisfactory review not only improves review impression and positively affects customers' booking intentions, but also reduces perceived risk and enhances customers' booking intentions. The review valence consistency plays a moderating role in the dual-path effect of online review types on booking intentions.

Syafganti and Walrave (2021)	N= 152 panel data respondents, Belgium.	*Heuristic-systematic Model of Information Processing*	Positive vs negative review valence, high number vs low number of reviews, reviewers' expertise, behavioral intentions,	Positive (vs negative) review valence has a greater impact on the intention to book and recommend a hotel. The number of reviews has no significant impact on the intention to book or to recommend.
Aureliano-Silva et al. (2021)	N = 72 (study 1) N = 123 (study 2) and N = 166 (study 3), Brazil, Experimental	*Signaling theory, and involvement theory*	Online reviews, consumers' intention to visit restaurants, involvement.	Online reviews with higher online ratings and emotional appeal led to higher restaurant visit intention. Review appeal significantly moderated the effect of online ratings on restaurant visit intention. Customers with low restaurant involvement were more impacted by emotional comments than by functional comments.
Sparks and Browning (2011)	N = 554, Australian database, Experimental	*n/a*	Willingness to make an online hotel booking, perceptions of trust in a hotel, *target* of the content of review: core features or customer service valence: high or low, frame: positive or negative, ratings: present or absent	Positive (vs negative) valence reviews lead to higher booking intentions and trust. Numerical ratings have no significant impact on booking intention or trust. Yet, when considered with positively framed information, ratings increase both booking intentions and trust. No significant differences in trust or hotel booking intentions based on age and gender.
Lien et al., (2015).	N = 366, Taiwan, Questionnaire	*n/a*	Brand image, perceived price, trust, perceived value, consumers' booking intentions, gender	Customer booking intention is a function of brand image, perceived price, and perceived value. The role of trust is not supported. Also, no significant differences were found based on gender.
Zhang et al. (2018).	N = 719,812 reservations for 4,359 restaurants, China.	*Theory of perceived risk and the theory of reasoned action*	Gender, restaurant online booking timing, group size, weekend meal, sell-out risk and online review rating and review text	Both average ratings and review texts are related to restaurant online booking. Yet, females tend to consider the review text, while males tend to consider more the review rating. Compared to men, women tend to book a restaurant in advance.
Chan et al. (2017).	N= 120 Germany and N= 200 Macau, Experimental	*Homophily and similarity-attraction theory*	Valence: predominately positive or negative, reader's demographic similarity with reviewer: high or low Hotel booking intention	Review valence has a positive impact on hotel booking intention. This link is moderated by reader-reviewer demographic similarity.
Assaker (2020).	N = 200, UK residents, Online questionnaire	*Technology acceptance model and credibility theory*	Trustworthiness, expertise, perceived usefulness, and perceived ease of use, usage intention toward user-generated content age, and gender	The intention to use online reviews is a function of perceived usefulness, perceived ease of use, trustworthiness, and expertise. For males, perceived usefulness was the most important factor, but it was not significant for females. Perceived ease of use was the key factor for females' and older people, but not for males and younger people. Also, expertise was important for younger, but not older people.

Table 2. Respondent profile

Demographic and Behavioral Factors	Total (N = 418)	
	N	%
Gender		
Male	130	31.1
Female	288	68.9
Age		
12-22	98	23.4
23-33	171	40.9
34-44	92	22.0
45-55	49	11.7
56 and above	8	1.9
Marital Status		
Single	265	63.4
Married	149	35.6
Prefer not to say	4	1.0
When you read online reviews, do you pay more attention to:		
Positive Review	45	10.8
Negative Review	64	15.3
Both	309	73.2
N\A	3	0.7
Do you normally check if the reviews are supported with photos and videos?		
Yes	375	89.7
No	43	10.3
Which platforms do you use to check online reviews? (You can choose more than one)		
TripAdvisor	123	29.4
Booking.com	396	94.5
Facebook	12	2.9
Instagram	100	23.9
Twitter	30	7.2
Others	9	2.0

Table 3. Items and constructs of the study

Factors and items	M.	S.D.	Loading	α	CR	AVE
PRV: Positive Review Valence				**.856**	**0.861**	**0.674**
PRV1: "I pay more attention to positive reviews".	3.78	.897	.855			
PRV2: "Positive reviews are of more value".	3.78	.866	.849			
PRV3: "I pay more attention to hotels that have a larger volume of positive reviews".	4.03	.904	.755			
NRV: Negative Review Valence				**.853**	**0.854**	**0.661**
NRV1: "An abundance of negative reviews will make you dislike a hotel."	4.00	.868	.837			
NRV2: "Negative reviews will terminate your booking intentions".	3.89	.883	.748			
NRV3: "The volume of negative reviews is important".	4.14	.910	.850			
RU: Rating Usefulness				**.840**	**0.807**	**0.589**
RU1: "The online hotel rating is useful for resolving doubts when booking a hotel".	3.87	.862	.919			
RU2: "The online hotel rating is useful to book hotels".	3.88	.859	.734			
RU3: "I can rely on the information provided in this online hotel rating".	3.63	.897	.619			
RU4: "The online hotel rating does not include false information" (Dropped).	-	-	-			
HBI: Hotel Booking Intention				**.887**	**0.883**	**0.653**
HBI 1: "I can rely on online reviews and ratings before I book a hotel".	3.79	.817	.810			
HBI 2: "Online reviews and ratings affect my intention to book a certain hotel".	3.88	.786	.855			
HBI 3: "I always pay close attention to hotel reviews and ratings when I book hotels".	3.97	.735	.747			
HBI 4: "After reviewing the online reviews and checking the ratings, the chance of booking a hotel is high".	3.90	.787	.817			

Note: CR = Composite reliability; AVE = Average variance extracted; S.D. = Standard deviation

Table 4. Reliability and validity

	CR	AVE	MSV	MaxR(H)	NRV	RU	PRV	HBI
NRV	0.854	0.661	0.607	0.861	**0.813**			
RU	0.807	0.589	0.531	0.878	0.693	**0.767**		
PRV	0.861	0.674	0.304	0.869	0.517	0.549	**0.821**	
HBI	0.883	0.653	0.607	0.888	0.779	0.729	0.551	**0.808**

Note: The square root of AVE is depicted in bold on the diagonal..

Table 5. Results of testing the structural equation model

Predictor		Dependent Variable	Estimate	t-value	P-value	R^2	Decision
H1: PRV	--->	HBI	.186	4.959	.000***		Supported
H2: NRV	--->	HBI	.489	9.389	.000***	.694	Supported
H3: RU	--->	HBI	.291	5.745	.000***		Supported

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 6. Moderating effect of consumer-generated visuals

	Coefficient	SE	t	p	LLCI	ULCI
Model 1						
Constant	2.443	0.153	15.999	0.000	2.143	2.743
PRV	0.379	0.038	9.880	0.000	0.304	0.454
Consumer-generated visuals	-1.672	0.431	-3.878	0.000	-2.519	-0.825
PRV x Consumer-generated visuals	0.412	0.119	3.467	0.001	0.178	0.645
R^2/Sig.			.5330/.000			
R^2 change/Sig.			.0208/.0006			
Model 2						
Constant	1.729	0.144	12.028	0.000	1.447	2.012
NRV	0.540	0.035	15.511	0.000	0.472	0.609
Consumer-generated visuals	-0.834	0.327	-2.547	0.011	-1.477	-0.190
NRV x Consumer-generated visuals	0.198	0.087	2.289	0.023	0.028	0.369
R^2/Sig.			.6768/.000			
R^2 change/Sig.	.0069/.02026					
Model 3						
Constant	2.087	0.146	14.325	0.000	1.801	2.373
RU	0.482	0.038	12.828	0.000	0.408	0.556
Consumer-generated visuals	-1.247	0.345	-3.620	0.000	-1.925	-0.570
RU x Consumer-generated visuals	0.256	0.091	2.826	0.005	0.078	0.434
R^2/Sig.	.6246/.000					
R^2 change/Sig.	.0118/.0049					

Note: The dependent variable in all models is Hotel Booking Intention; PRV = Positive review valence; NRV =

Negative review valence; RU = rating usefulness

Table 7. Moderating effect of gender

	Coefficient	SE	t	p	LLCI	ULCI
Model 1						
Constant	3.012	0.297	10.153	0.000	2.429	3.595
PRV	0.239	0.072	3.303	0.001	0.097	0.381
Gender	-1.060	0.339	-3.126	0.002	-1.726	-0.393
PRV X Gender	0.260	0.084	3.106	0.002	0.096	0.425
$R^2/Sig.$			*.5211/.000*			
$R^2\ change/Sig.$			*.0170/.0020*			
Model 2						
Constant	2.487	0.292	8.521	0.000	1.913	3.060
NRV	0.363	0.070	5.165	0.000	0.225	0.501
Gender	-1.146	0.324	-3.536	0.001	-1.784	-0.509
NRV x gender	0.268	0.078	3.420	0.001	0.114	0.422
$R^2/Sig.$			*.6821/.000*			
$R^2\ change/Sig.$			*.0151/.0007*			
Model 3						
Constant	2.720	0.286	9.507	0.000	2.158	3.282
RU	0.326	0.073	4.454	0.000	0.182	0.469
Gender	-1.095	0.323	-3.385	0.001	-1.730	-0.459
RU X Gender	0.264	0.083	3.180	0.002	0.101	0.427
$R^2/Sig.$			*.6148/.000*			
$R^2\ change/Sig.$			*.0152/.0016*			

Note: The dependent variable in all models is Hotel Booking Intention; PRV = Positive review valence; NRV = Negative review valence; RU = rating usefulness

Table 8. Moderating effect of age

	Coefficient	SE	t	p	LLCI	ULCI
Model 1						
Constant	1.153	0.231	4.987	0.000	0.699	1.607
RU	0.696	0.061	11.485	0.000	0.577	0.816
Less than 24 & 24 to 45	1.046	0.297	3.526	0.001	0.463	1.630
Less than 24 & Above 45	1.115	0.409	2.724	0.007	0.310	1.919
RU x (Less than 24 & 24 to 45)	-0.244	0.077	-3.160	0.002	-0.395	-0.092
RU x (Less than 24 & Above 45)	-0.260	0.108	-2.407	0.017	-0.473	-0.048
R^2/Sig.			*.3839/.000*			
R^2 change/Sig.			*.0168/.0039*			
Model 2						
Constant	1.364	0.280	4.872	0.000	0.814	1.914
PRV	0.646	0.075	8.657	0.000	0.499	0.793
Less than 24 & 24 to 45	0.992	0.336	2.957	0.003	0.333	1.652
Less than 24 & Above 45	1.698	0.469	3.621	0.000	0.776	2.620
PRV x (Less than 24 & 24 to 45)	-0.240	0.088	-2.730	0.007	-0.413	-0.067
PRV x (Less than 24 & Above 45)	-0.443	0.118	-3.747	0.000	-0.676	-0.211
R^2/Sig.			*.2859/.000*			
R^2 change/Sig.			*.0256/.0007*			
Model 3						
Constant	1.041	0.199	5.218	0.000	0.649	1.433
NRV	0.691	0.050	13.958	0.000	0.594	0.789
Less than 24 & 24 to 45	0.795	0.267	2.983	0.003	0.271	1.320
Less than 24 & Above 45	1.383	0.497	2.786	0.006	0.407	2.359
NRV x (Less than 24 & 24 to 45)	-0.171	0.066	-2.606	0.010	-0.300	-0.042
NRV x (Less than 24 & Above 45)	-0.332	0.122	-2.720	0.007	-0.571	-0.092
R^2/Sig.			*.4685/.000*			
R^2 change/Sig.			*.0140 /.0047*			

Note: The dependent variable in all models is Hotel Booking Intention; PRV = Positive review valence; NRV = Negative review valence; RU = numerical rating usefulness

Table 9. Comparison of the current study's findings with previous research

Factor	Key similarities with previous research	Key differences with previous research and theoretical destinctions
Positive review valence	Hotel booking intention is positively influenced by review valence (Chan et al., 2017).	Review valence has a moderating role between online review types and hotel booking intention (Bai et al., 2022). Positive review valence has a non-significant influence on hotel booking intention (El-Said 2020, Zhao et al., 2015).
Negative review valence	Negative reviews have a stronger influence on booking intention than positive reviews (Avant, 2013; Zhao et al., 2015). Negative reviews have a significant influence on hotel booking intention (El-Said, 2020; Sparks and Browning, 2011).	Negative review valence has the weakest influence on hotel booking intention (Sparks and Browning, 2011; Syafganti and Walrave, 2021; Zhong et al., 2014).
Numerical rating usefulness	Numerical ratings influence purchase intentions (Aureliano-Silva et al., 2021; Öğüt and Taş, 2012; Zhang et al., 2018).	Numerical ratings have a non-significant impact on hotel booking intention (Sparks and Browning, 2011).
Hotel booking intention	n/a	Intention to use online reviews in booking decisions is a function of perceived usefulness, perceived ease of use, trustworthiness, and expertise (Assaker, 2020); brand image, perceived price, and perceived value (Lien et al., 2015); quantity of review, content of review, and number of useful comments (Xia et al., 2022); Review depth, review readability, reviewer experience, reviewer reputation, and review habit (Zhang et al., 2022).
Consumer generated visuals	Visual presentations influence booking intentions (Amin et al., 2021).	Consumer generated visuals moderate the effect of positive review valence, negative review valence, and numerical rating usefulness on hotel booking intention.
Gender	Males and females treat online reviews differently (Assaker, 2020; Chang et al., 2019; Zhang et al., 2018).	Gender does not have an influence on hotel booking intention (Lien et al., 2015; Sparks and Browning, 2011). Gender moderates the effect of positive review valence, negative review valence, and numerical rating usefulness on hotel booking intention.
Age	Online reviews are treated differently by younger and older consumers (Assaker, 2020).	Younger and older consumers do not treat online reviews differently (Sparks and Browning, 2011). Age moderates the effect of positive review valence, negative review valence, and numerical rating usefulness on hotel booking intention.