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and liking expectation for restaurants**

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The final, published version in International Journal of Contemporary Hospitality Management, 34 (6), pp. 2049-2070, 2022 is available at:

<https://doi.org/10.1108/IJCHM-09-2021-1091>

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# **How visual attention to social media cues impacts visit intention and liking expectation for restaurants**

## **Abstract**

*Purpose.* This research examined how social media (TripAdvisor) content influences restaurant visit intentions and liking expectations, how online review valence affect the viewing behavior of the social media page, and which social media elements capture the initial attention of the consumer.

*Design/methodology/approach.* The study used eye-tracking and self-reported data, and applied a 2-within-subjects design manipulating rating valence.

*Findings.* The pictures posted by firms and opinions posted by users attracted consumers' attention. However, in the negative valence condition, participants needed to expand upon the content by reading additional (and more detailed) online reviews with specific cues, revisited the content more often, and more closely fixated on specific online ratings. Moreover, the picture of the restaurant was the first area seen (reflecting a bottom-up process) and the third-party ad tended to be viewed last (reflecting selective attention).

*Implications.* All social media elements are seen but only some affect decisions, with negatively (vs. positively) valenced reviews requiring consideration of an extra element. Of relevance to managers, this study stresses the importance of the pictorial element and the influence of user-generated content on the attention and judgment of consumers.

*Originality.* This study suggests that, in order to form an opinion, viewers devote more cognitive effort and attention when evaluating restaurants with negatively (vs. positively) valenced reviews. However, viewing patterns appear unaffected by review valence. It also demonstrates how consumers pay attention to different social media elements.

**Keywords:** attention, consumer behavior, eye-tracking, online reviews, social media content, valence

**Article classification:** original article – research paper

## 1 Introduction

Social media platforms contain online reviews from users as well as communicative content from the companies themselves (Li *et al.*, 2021). Academic research, including meta-analyses, has shown that online reviews influence consumer choices (Babić Rosario *et al.*, 2016, 2020; Pourfakhimi *et al.*, 2020), including sales (Chu *et al.*, 2020). Furthermore, a TripAdvisor survey of restaurateurs in five markets revealed that social media marketing channels generate greater return on investment than other media (TripAdvisor LLC, 2017). Notwithstanding, the effect of restaurant reviews in social media remains understudied (for a review, see Rodríguez-López *et al.*, 2019).

Social media content features three distinct characteristics. First, it contains both user-generated content (UGC) and firm-generated content (FGC). Second, it displays different formats: mainly text and pictures. Third, its content can be positive or negative—typically termed as valence. Therefore, social media content differs in origin, format type, and valence. Lang's (2000) limited capacity model suggests that people have limited mental resources with which to process all available information. Thus, in tension with the principle of least effort, processing social media content can be cognitively demanding. Furthermore, the assumption that consumers pay attention to all cues, in the same order, and with the same intensity, contradicts such existing postulations as signaling theory, information processing theory (Kirmani, 1997), and selective attention. Extending such theoretical bases to social media, we expected consumers to view each social media cue in varying ways, ultimately affecting their choices.

Relevant literature reviews have examined a variety of research directions for studies on the role of social media in hospitality, tourism and travel (see Chu *et al.*, 2020). Further, extensive research has used surveys, and to a lesser extent, crawled data (Chu *et al.*, 2020;

Nusair, 2020) to investigate how consumers process online reviews (Risselada *et al.*, 2018); but virtually no studies have used eye-tracking measurements to investigate “whether and how consumers use different elements of reviews in the decision-making process” (Maslowska *et al.*, 2020, p. 283). Recent studies have called for “research to employ eye-tracking methodology to advance understanding of consumers’ processing of eWOM [electronic word-of-mouth]” (Babić Rosario *et al.*, 2020, p. 439). Eye-tracking research has proven that consumers’ attention drives decisions (Orquin *et al.*, 2013). Indeed, very few previous studies have examined social media viewing patterns (Bigne *et al.*, 2020, 2021; Muñoz-Leiva *et al.*, 2019) and, to the best of our knowledge, ours is the first to explore the relationship between social media visual attention and the intention to visit and expected liking of the service under different valence conditions. We thus seek to fill the research gap concerning how attention paid to heuristic cues in social media shapes consumer decision-making. To achieve this, we investigated how consumers view social media content (both UGC and FCG) in different formats (text and pictures), and with different valence, as well as how these heuristic cues influence consumers’ intention to visit and their liking expectations in the context of restaurants.

Online reviews can be deconstructed into several distinct cues, thereby enabling our investigation into which are the most impactful on consumer decision-making. We sought to identify which elements of information consumers consider when viewing business social media pages. On social media platforms, many elements are classified as heuristic cues (Chung *et al.*, 2017; Hlee *et al.*, 2018). Heuristic processing is associated with decisions based on cues featuring limited information (e.g., heuristic cues). For example, overall restaurant ratings posted on TripAdvisor are evaluated by consumers heuristically (Yoon *et al.*, 2019), for instance, by their using the “consensus implies correctness” heuristic. These star ratings have

become highly important; firms are witnessing firsthand the significant sales impact of well-managed star ratings (Yoon *et al.*, 2019).

The valence of social media content remains a challenging research topic. In general, positive content elicits purchases. However, research suggests that negative content can more strongly impact purchase decisions and can even benefit the brand (Luan *et al.*, 2021). We argue that these inconsistent findings could be explained by the filters that consumers apply when sorting and choosing between positive or negative content (Tata *et al.*, 2020), as filtering leads to different visual attention patterns. Therefore, how consumers view social media content containing multiple UGC/FGC information cues, particularly with varied valences, requires further research.

Therefore, this study has three aims: (i) to understand how UGC valence affects consumers' social media content viewing; (ii) to examine the influence of the content viewed from a TripAdvisor page on visit intention and liking expectations; and (iii) to evaluate how consumers respond to the content, particularly in terms of which elements capture their initial attention. To achieve these aims, we conducted an empirical study based on explicit self-reporting measures and implicit eye-tracking measures. This research contributes to the relevant literature through its analysis of viewing behavior. It demonstrates how consumers process specific content cues based on review valence. It also provides evidence on how consumer intentions and expectations relate to the information processing of restaurant content. Moreover, we offer managerial insights into comprehensively understanding the role that content plays in consumer behavior and the ways in which attention is allocated to different social media elements. Our results may help managers delineate their strategies for social media communication, particularly when the valence of a comment is negative.

The remainder of the work is structured as follows. Section 2 introduces the main theoretical background and poses our research questions (RQs). Section 3 outlines the

methodology and measures. Section 4 provides the results and discusses them. Section 5 addresses the general conclusions of our findings, provides the theoretical and managerial implications, and examines the study's limitations in addition to potential avenues for future research.

## **2 Theoretical background**

### *2.1 Social media valence*

Although the findings of previous studies are inconclusive, it is generally recognized that valence can affect consumers' perceptions of a review's usefulness (Liu and Park, 2015; Park and Nicolau, 2015). Whereas some studies have posited that negative electronic word-of-mouth (eWOM) has a greater influence on sales than positive eWOM (Chevalier and Mayzlin, 2006), others have demonstrated the reverse (Babić Rosario *et al.*, 2016), including eye-tracking studies analyzing online comments (Shi *et al.*, 2020). Surprisingly, little attention has been paid to what—and how—social media content is viewed. Research has shown that consumers may filter information cues and thus may view either the entirety of the content or only parts of it (Bigne *et al.*, 2020; Varga and Albuquerque, 2019). However, while many previous studies have analyzed the effects of social media content's elements (Hlee *et al.*, 2018), they have neglected to offer an integrative perspective in examining the effects of both its types (i.e., UGC and FGC).

The literature demonstrates that trust in UGC generates expectations about destinations, that is, positive UGC creates positive expectations, and vice versa (Narangajavana *et al.*, 2017). However, for online booking of hotels, negative online reviews negatively influence the number of bookings whereas positive reviews have no impact on it (Zhao *et al.*, 2015). For restaurants, ratings regarding the service, environment, and especially the food have all been found to correlate positively with online popularity (Zhang *et al.*, 2010). Daugherty and

Hoffman (2014) manipulated message valence (positive, neutral, negative) of two product categories, cars and restaurants, and found that eWOM valence had a main effect on fixation duration, with participants viewing negative stimuli for the longest periods of time, followed by positive, then neutral. The same experiment was conducted to include the structural elements (text and images) as independent variables and restaurants as the product (Hoffman and Daugherty, 2013), with attention measured as the total number of fixations on pre-defined areas of interest (AOI). The authors found that participants fixated most often on non-luxury restaurant pictures and on luxury restaurant text. Valence was found to have an interaction effect with element type for luxury restaurants.

As mentioned above, social media valence is key to consumer decision-making. Depending on UGC valence, consumers might attach different degrees of importance to UGC and FGC in decision-making and consequently follow different screening strategies. Thus, we assessed whether consumers view social media content differently based on the valence of the reviews they read. Because firms cannot interfere in TripAdvisor's metrics, we have instead focused upon the valence of user evaluations. Therefore, we pose the following research question:

*RQ1: Does viewing behavior vary depending on UGC valence?*

## *2.2 Viewing social media cues*

Daugherty and Hoffman (2014, p. 95) stated that “consumer attention is a critical variable that should not be neglected in research, theory, and practice pertaining to eWOM communication within social media.” In fact, a bibliometric study on the hospitality and tourism field (2002–2016 period) showed a steep growth on consumer behavior research (2011–2016 period), particularly related to eWOM topics (Nusair *et al.*, 2019). So far, research has established that consumers' viewing of social media UGC is a “complex phenomenon” that should be examined



in order to understand the effects of eWOM, and that message elements are impactful only if viewers notice them (Hoffman and Daugherty, 2013). A product's social media page usually contains UGC and other product-related FGC (e.g., pictures and technical information). These elements may well vary in importance to the consumer. Indeed, the literature contains inconclusive findings concerning how review elements affect consumer behavior (Baek *et al.*, 2012; Chung *et al.*, 2017; Yang *et al.*, 2017). Furthermore, the literature has tended to ignore how users' social media viewing affects visit intention and liking expectations.

Visual attention has been described as a proxy for preference (Wedel and Pieters, 2014); in other words, an effective indicator of the viewer's focus is to identify what is being looked at. Just and Carpenter (1975) revealed a direct link between visual attention and mental processing when the visual stimulus is important in a task's encoding and processing. Filtering content viewing is the result of selective attention, which itself is driven by the principle of least effort. To reduce cognitive effort, people use heuristic mechanisms in which they apply previously formed schemas, rules of thumb, in viewing stimuli instead of carefully analyzing each piece of information presented. Social media elements tend to differ in how they capture attention (bottom-up or top-down) (Maslowska *et al.*, 2020). For example, in social media settings, consumers' attention follows a top-down mechanism when only text is present, yet this changes to a bottom-up process when pictures are included (Bigne *et al.*, 2020).

Consumers may examine some or all of social media content's multiple UGC and FGC cues. In addition, the visual attention paid to each cue may differ, thereby influencing the cue's ability to impact consumers' judgments. Since the overall rating condenses the assessment of the service provided, one could argue that, in accordance with the principle of least effort, consumers will tend to view this cue first. Furthermore, Bigne *et al.* (2020) have shown that the online rating is viewed the most. Therefore, we posit that, because of the nature of social media content, consumers may form impressions about services based on the overall ratings

provided by other consumers, and that these impressions ultimately drive visit intention and liking expectations for restaurants. When presented with less informative cues (i.e., heuristic cues) compared to message content cues, consumers might pay varying levels of attention to them and may consider all—or only some—in order to reach a decision. Therefore, we pose the following research question:

*RQ2:* Which social media content cues (overall rating, pictures, detailed ratings, and opinions) affect (a) intention to visit and (b) liking expectations?

Following the attention capture and transfer (AC\_TEA) model (Pieters and Wedel, 2004) proposed in printed advertisements, we acknowledge that stimuli can engage bottom-up or top-down visual mechanisms. The former occurs involuntarily by diverting attention to a stimulus's salient features, whereas the latter involves cognitive strategies and is goal-oriented. For example, Pieters and Wedel (2004) found that pictures capture attention more effectively (e.g., they attract higher initial attention) than text.

Social media content consists of multiple cues, but is the first the most important? The “first impression” aspect has been previously addressed in advertising research (Lindgaard *et al.*, 2006; Pieters and Wedel, 2012). Pieters and Wedel (2012) suggested that readers can understand the essence of a printed advertisement within 100 milliseconds or less, typically during the first eye fixation. Using self-reported measures, Lindgaard *et al.* (2006) found that a website's visual appeal is gauged in the first 500 milliseconds. These rapid judgments are recognized as cognitive confirmation bias effects (Nisbett and Ross, 1980) that lead viewers to search for confirmatory evidence of what they first saw. In a Facebook-based study in which the participants viewed a series of posts (social, news, political), the eye-tracking data revealed that posts containing richer content, such as pictures and links, attracted more attention (Vraga *et al.*, 2016). To the best of our knowledge, no previous study has explicitly addressed the

question of what users initially view in social media content, with some exceptions (e.g., Bigne *et al.*, 2021). Therefore, we address the following question:

*RQ3*: Do different content types (i.e., picture vs. text) capture different levels of initial and subsequent attention?

### **3 Methodology**

This study relies on the eye-tracking data and self-reported data that we obtained from our experimental design. We created TripAdvisor-type online review pages for four types of specialty restaurants: pasta, pizza, paella, and steak. We chose these categories for being the most representative in the study context and for their popularity on TripAdvisor. More generally, we chose restaurants due to their economic importance and the influence of online restaurant reviews on consumer choices. The global full-service restaurant (i.e., table-service restaurants) market in 2020 was estimated at USD 1.2 trillion and has been projected to reach USD 1.7 trillion by 2027 (Lock, 2021). Thus, it is notable that, despite the steep increase in food delivery demands due to the COVID-19 pandemic, the full-service restaurant format continues to experience positive growth. We chose to use TripAdvisor as the model for our online review pages because it is among the largest restaurant review platforms and claims to be more influential than Google, Facebook, and Yelp in consumers' choices of eateries (TripAdvisor LLC, 2017, 2018).

#### *3.1 Experimental design*

We applied a 2-within-subjects (WS) design, with rating valence (positive = 4.5 stars vs. negative = 1.5 stars) as the independent variable, and (a) the probability of visiting the restaurant and (b) the expected liking of the restaurant as the explicit dependent variables. We treated the eye-tracking metrics as independent or dependent variables, depending on the analysis. We mimicked the same upper-page layout as TripAdvisor's desktop display. Written

comments were excluded due to their subjective interpretation. The experiment featured four restaurant types and two conditions, namely positive and negative valence. We used two groups of participants to cover both conditions for all restaurants, and all participants viewed four stimuli (two restaurants per condition; see Table I). We counterbalanced the presentation order across the participants.

**[Table I near here]**

### 3.2 *Participants*

Our sample comprised 128 Spanish residents representative of the area's population, of whom 100 were recruited by an external agency and 28 internally to account for possible data loss. We recorded the following demographic information: 51.6% female;  $M_{age} = 32.97$ ,  $SD_{age} = 10.14$ , age range: 18–56; 68.5% employed, 26% students, 5.5% unemployed; 83% users of the TripAdvisor restaurant platform; and 98% restaurant patrons. The participants recruited by the external agency were financially compensated. The internal recruitment was conducted by two researchers, who approached staff and students enrolled at the university where the study took place. All participants were fully informed as to the nature of the study and their participation. We selected Spain due to its representative size and increasing potential in the restaurant market (TripAdvisor LLC, 2019). Following the analysis of the raw data, we excluded four participants and included only partial data from another five due to poor eye-tracking data quality (recordings below the 70% threshold).

### 3.3 *Procedure and task*

The participants signed informed consent forms. The eye-tracking system, the Tobii X2-30 Compact, was calibrated. The stimuli were viewed through a 23-inch 1920 x 1080-pixel

monitor, and the data were recorded through iMotions software (iMotions 8.1, <https://imotions.com>). We collected the data in February 2020.

The first screen showed the experiment's instructions; then the TripAdvisor stimuli were displayed. To standardize viewing time, each restaurant page was shown for 30 seconds. Due to the participants' familiarity with TripAdvisor, we expected them to reproduce their actual viewing patterns. After being exposed to each restaurant for 30 seconds, participants were redirected to a survey showing the same stimulus to aid recall and were asked to rate the probability of visiting the restaurant on a slider bar (range 0 to 100%). Next, participants were asked how much they believed they would like the restaurant (i.e., whether they should visit it) by using a slider bar ranging from "I would dislike it a lot" to "I would like it a lot." The process was repeated for each restaurant, and the presentation order of the restaurants was counterbalanced among the participants. Finally, the sample answered demographic questions.

#### *3.4 Measures and analyses*

We used a questionnaire and eye-tracking as our measurements. The questionnaire captured participants' intention to visit and liking expectations for the restaurant. Eye-tracking studies (see Wedel and Pieters, 2006) tend to use the following metrics: time to first fixation (TTFF; ms), time spent in fixations (sec), number of visits (revisits), and fixation count (i.e., the number of total fixations) by AOIs. TTFF is valuable in identifying which element first captures the participant's attention and facilitates mapping the initial viewing pattern of the entire stimulus. Time spent in fixations measures the attention focused on an element. High attention could indicate either the element's importance or its greater cognitive processing demand. Revisits identify how often participants look at elements, while fixation count reveals how many fixations each element receives.

To analyze the eye-tracking data, we divided each TripAdvisor page into seven AOIs reflecting both UGC and FGC (Figure 1) as follows. AOI\_1: overall restaurant rating (top-left corner); AOI\_2: pictures posted by company (top); AOI\_3: detailed ratings of services, such as food, quality, and price (center-left); AOI\_4: details of restaurant type (center-center); AOI\_5: location and contact details (center-right); AOI\_6: distribution of opinions, from excellent to terrible (bottom-left center); and AOI\_7: third-party online advertisement (bottom-right).

**[Figure 1 near here]**

Regarding the analyses performed, we describe here the main approach utilized for each RQ. Further and post-hoc analyses can be seen in the Results and Discussion section.

To answer RQ1, we performed a repeated-measures (WS) ANOVA for each dependent variable. The four above-mentioned eye-tracking variables for each AOI served as the dependent variables. We set valence as the independent variable. The four trials were condensed into two by aggregating the two positive, and the two negative, valence trials.

To answer RQ2, we performed four generalized linear models: a WS regression (GLM-WS) with a robust estimation procedure for each dependent variable (i.e., the questionnaire metrics). The independent variables were valence and the time spent in fixations for AOIs 1, 2, 3, and 6. We excluded AOI\_4 (details), AOI\_5 (location and contact details, which was identical for all restaurants) and AOI\_7 (third-party advertisement) due to their low relevance for the dependent variables. We included restaurant type in order to control for it. Following the GLM-WS formula with the fixed factors (Formula 1),  $Y =$  dependent variable,  $\beta_i =$

regression coefficients,  $A_i$  = time spent in fixations for each AOI ( $i = 1, 2, 3, 6$ ),  $V$  = valence,  $R_i$  = dummy variable for restaurant type, and  $\varepsilon$  = residual term.

$$Y = \beta_0 + \beta_1 A_1 + \beta_2 A_2 + \beta_3 A_3 + \beta_4 A_6 + \beta_5 V + \beta_6 A_1 V + \beta_7 A_2 V + \beta_8 A_3 V + \beta_9 A_6 V + \beta_{10} R_1 + \beta_{11} R_2 + \beta_{12} R_3 + \varepsilon \text{ (Formula 1)}$$

We combined all four trials and conducted descriptive analyses in order to answer RQ3.

## 4 Results and discussion

### 4.1 Manipulation check

As stated previously, we expected valence to affect the dependent variables of RQ2. Accordingly, we first conducted a repeated-measures ANOVA to compare valence's effects on visit intention (VisInt) and expected liking (ExpLik) as the dependent variables in both the positive and negative conditions. The results revealed that valence had a statistically significant effect on VisInt ( $F(1, 127) = 168.98, p = .000, \eta^2 = .57$ ), where positive (negative) valence increases (decreases) VisInt ( $M_{pos} = 72.37, SD = 17.69; M_{neg} = 34.67, SD = 24.61$ ), and ExpLik ( $F(1, 127) = 155.22, p = .000, \eta^2 = .55$ ), where positive (negative) valence increases (decreases) ExpLik ( $M_{pos} = 72.67, SD = 17.00; M_{neg} = 40.57, SD = 23.04$ ). Therefore, the valence manipulation significantly affected behavior.

### 4.2 Does viewing behavior vary depending on UGC valence?

To address RQ1, we set the following eye-tracking metrics as the dependent variables: TTFF, time spent in fixations, revisits, and fixation count across the valence conditions. Our first step involved plotting each metric by valence condition to visually observe the participants' viewing behaviors (Figure 2). The visual inspection of the plots showed no valence influence on stimuli viewing patterns.

**[Figure 2 near here]**

The second step involved the statistical analysis using a WS-ANOVA (see subsection 3.4). The significant results are shown in Table II. The TTFF results showed no difference across valence for any of the AOIs, meaning that the TTFF of each was the same for each valence condition. The analysis revealed that time spent in fixations on AOI\_5 and AOI\_6 differed across the valence conditions. The time spent in fixations was longer in AOI\_5 in the positive condition and longer in AOI\_6 for the negative condition. The revisits results showed that AOI\_1 and AOI\_5 differed across the valence conditions. AOI\_1 was revisited more times in the negative condition, and AOI\_5 more often in the positive condition. The results for fixation count mimicked the revisit results.

**[Table II near here]**

In summary, participants followed the same viewing patterns across stimuli regardless of UGC valence. This is consistent with Bigne *et al.* (2021), who also found a common viewing pattern independent of valence while using positive and neutral TripAdvisor ratings. However, we found some variations for certain AOIs. For the time spent on fixations, AOI\_5 (location and contact) had more viewing time in the positive than in the negative valence condition, whereas the opposite was true for AOI\_6 (reviews). In line with Shi *et al.* (2020), we found that participants fixated longer on the opinions element of written comments (AOI\_6) in the negative valence condition than in the positive condition. Regarding AOI\_5, we would propose that the higher attention paid to this element in the positive valence condition might be due to searching for practical information (i.e., address) derived from a positive, but unconscious,



attitude (i.e., intention to visit). The number of visits and fixations were higher for AOI\_1 (overall rating) in the negative rather than in the positive valence condition, whereas the reverse was true for AOI\_5.

Although some neurological studies have demonstrated that negative stimuli evoke more attention than positive or neutral stimuli (e.g., Smith *et al.*, 2003), and that negative reviews generally receive higher and longer-lasting fixation counts than positive ones (Daugherty and Hoffman, 2014; Moriuchi, 2021), we found no substantial differences between the two valence conditions. This could have been due to how we presented the stimuli to the participants: both conditions were shown for the same amount of time. This might have masked a possible difference in time spent fixating on the stimuli across conditions compared to if the task had been self-paced. However, we did find that parts of the UGC received more attention when negatively (rather than positively) valenced, corroborating the importance of well-managed star ratings (Yoon *et al.*, 2019).

#### 4.3 *The effect of visual attention of social media content on intention to visit and liking expectations*

RQ2 aimed to address which FGC (AOI\_2 [picture]) and UGC areas—overall rating (AOI\_1), detailed rating (AOI\_3), and opinions (AOI\_6)—affect intention to visit (VisInt) and liking expectations (ExpLik). We used the time spent in fixations to measure visual attention. As mentioned earlier (see subsection 3.4), we performed a GLM-WS.

For VisInt and ExpLik, the interactions terms of valence with time spent in fixations were significant. To analyze the simple effects, we conducted two further GLM-WS, one for each valence condition (see Table III for the results). The data for the positive valence condition revealed that, for AOI\_2, an increase of one second in fixation time decreased VisInt by 1.01%, but that this same addition increased VisInt by 1.69% for AOI\_6. In the negative valence

condition, a one-second increase in fixation time on AOI\_2 led to an increase of 1.29% in VisInt, and 2.00% and 1.98% decreases for AOI\_3 and AOI\_6, respectively. For ExpLik, the data for the positive valence condition revealed that, for AOI\_6, a one-second increase in fixation time increased ExpLik by 1.38%. In the negative valence condition, for AOI\_1 and AOI\_2, a one-second increase in fixation time led to increases of 4.17% and 0.97% in ExpLik, respectively. For AOI\_6, this same increase led to a 2.11% decrease in ExpLik.

**[Table III near here]**

The time spent in fixations indicated that the four AOIs differed in their effects on VisInt and ExpLik, and that these differences depended on UGC valence. The pictures (AOI\_2) and the opinions section (AOI\_6) affected VisInt scores. However, the effect went in opposite directions depending on UGC valence. With positive UGC, the greater the fixation on pictures, the lower the VisInt; but the more the participants fixated on opinions, the higher their VisInt. Conversely, with negative UGC, longer fixations on AOI\_2 led to higher VisInt, whereas longer fixations on AOI\_6 led to lower VisInt. Moreover, for the negative valence stimuli, AOI\_3 (detailed ratings) also negatively influenced VisInt (i.e., increased fixation time on AOI\_3 decreased VisInt).

These direction effects were the same for ExpLik, although the participants relied on a slightly different set of cues. Only AOI\_6 influenced ExpLik in the positive valence condition. For the negative condition, the participants considered pictures and opinions (AOI\_2 and AOI\_6) in their ExpLik ratings. Moreover, for the negative valence condition, the participants also took AOI\_1 into account, although somewhat unexpectedly the effect's direction was opposite of that found for AOI\_6. Given that both AOIs conveyed ratings information, it seems

implausible that a longer fixation duration on the overall negative rating (AOI\_1) would increase their VisInt. Accordingly, as this result may be based on a type I error, it should be treated with caution.

Therefore, the answer to RQ2 is that FGC pictures of a restaurant (AOI\_2) and the UGC opinions regarding it (AOI\_6) are the cues that affect VisInt and ExpLik (for the positive valence, only AOI\_6 was significant). In the negative rating condition, participants also considered AOI\_3 as an additional UGC cue in assessing their VisInt. These findings appear to suggest that UGC functions as an “indicator of information credibility” impacting consumers’ behaviors and attitudes (Flanagin and Metzger, 2013). Moreover, negative UGC had a stronger impact on intention and expectation than positive UGC (see beta coefficient values). This supports previous findings that negative (vs. positive) reviews tend to be more influential (e.g., Chevalier and Mayzlin, 2006), especially for experience goods (Park and Lee, 2009).

Surprisingly, we found that the direction of firm-posted pictures’ influence was opposite that of its UGC counterpart. To the best of our knowledge, no study has previously evaluated the interplay between the attention paid to a firm-posted picture and the ratings provided by consumers on purchase or visit intentions. However, it should be noted that previous FGC studies have reported mixed results. Indeed, prior research has found FGC (including highly visual elements, such as Instagram posts) to positively influence visit (Ballester *et al.*, 2021) and purchase intentions (Poulis *et al.*, 2019) but to negatively impact the purchase intentions of new clients (Santiago *et al.*, 2022).

In our case, one might conclude that an FGC picture is perceived as less credible than a UGC photo because of the restaurant’s motives for posting it. However, this would not explain the results for the negative valence, in which pictures increased self-reported VisInt. One possible explanation is that the picture did not sufficiently “match” the positive and the

negative valence scores. For example, the positively evaluated restaurants had an overall rating of 4.5 stars; thus, the picture might have been perceived as not sufficiently “good” or “attractive” for such a high rating. Moreover, the reverse may be the case for the negative valence, in which the overall rating was 1.5 stars; in this case, the pictures might have been perceived as more attractive or of a higher quality than might be expected for such a low rating, and they may even have triggered a biological desire to eat the food.

We found that participants did not use all the information available to make their judgments. Chaiken (1980) found that information processing is more exhaustive for high, rather than low, levels of involvement with the message’s topic. Given that our participants were passively receiving restaurant information and were not organically motivated to find a place to eat, their use of few cues to reach a decision is consistent with the principle of least effort. Nonetheless, it is noteworthy that those simple cues still shaped intentions and expectations, possibly by activating the “consensus implies correctness” heuristic, as can be inferred from the analysis of the explicit data (see subsection 4.1) More interesting still is that, with a positive UGC valence, the participants relied on two cues to form opinions, but needed an additional cue when the UGC valence was negative. This supports Varga and Albuquerque’s (2019) finding that exposure to negative content motivates additional information-seeking, even if this implies the use of more cognitive resources.

#### *4.4 The effect of initial attention to social media cues on subsequent attention*

Because UGC valence did not affect the participants’ viewing patterns, to address RQ3, we combined all four trials to gain insights into their viewing patterns during the social media stimuli. This involved three complementary analyses: (i) the order of initial fixations on the AOIs to determine which first captured viewers’ attention; (ii) the percentage of participants who looked at each AOI in every possible viewing order; and (iii) the time spent in fixations on each AOI based on the total fixation and stimulus presentation times (30s).

Based on the averaged data, the ranking order is clear for the three first-viewed AOIs and the last position. As shown in Figure 3, the FGC pictures (AOI\_2) were the first to be viewed, followed by detailed ratings (AOI\_3) and restaurant type (AOI\_4). The participants next viewed either overall rating (AOI\_1) or opinions (AOI\_6). The TTFF of overall star rating (AOI\_1) did not differ significantly from AOI\_5 (location or contact details) or AOI\_6, whereas AOI\_5 did differ from AOI\_6 ( $F(1, 123) = 5.32, p = .023$ ). Thus, from AOI\_1 or AOI\_6, they looked at either AOI\_5, AOI\_1, or AOI\_6, depending on which AOI was previously viewed. The third-party advertisement (AOI\_7) was the last to be viewed.

This pattern of viewing order was similar to that found by Bigne *et al.* (2021), who used a TripAdvisor-like layout excluding the picture at the top (our AOI\_2). They found that the areas on the top-left and top-center (comparable to our AOI\_3 and AOI\_4) attracted the fastest initial attention. In contrast to our findings, their third-party advertisement (our AOI\_7) captured attention faster than UGC elements (our AOI\_6). However, important layout variations may explain these differences. We presented two pictorial elements: the top picture (AOI\_2) and the small advertisement (AOI\_7). However, in Bigne *et al.* (2021), the advertisement was the only pictorial content and was of a larger size. These differences might have generated increased and quicker attention.

**[Figure 3 near here]**

A viewer's initial attention can be a signal of either (i) motivation to look, that is, a goal-oriented, top-down mechanism; or (ii) an involuntary response to a random stimulus, that is, a bottom-up mechanism. Therefore, to more comprehensively understand the variation of

the TTFFs across AOIs, we computed the percentage of participants that looked at each AOI in every possible viewing order (see Table IV).

**[Table IV near here]**

Table IV shows that AOI\_2, a pictorial element, captured the initial attention of most participants (81.4%), a result consistent with Pieters and Wedel (2004). The opposite was the case with the third-party advertisement (AOI\_7), which tended to be the last area viewed. The superior performance of the picture (AOI\_2) in grabbing initial attention may reflect a bottom-up mechanism, especially due to this AOI's comparative salience. Although the third-party advertisement also had salient features (colors and images), it was much smaller than AOI\_2 and was positioned in a low-attention area. Moreover, we observed an interplay between salience effects (bottom-up mechanism) and top-down mechanisms. The fact that the third-party advertisement was the last-viewed AOI was potentially indicative of a strong top-down influence on initial attention, such as a deliberate lack of interest in the advertisement (see Kowler, 2011, for an explanation on the notion of a saliency map and how it relates to top-down processes). Due to the participants' familiarity with the TripAdvisor layout, they would have been aware that the bottom-right area is dedicated to advertising. Hence, they might have employed a selective attention process, at least regarding initial attention.

Furthermore, our results showed a transfer effect from pictorial to text content in a social media setting, which is in line with Pieters and Wedel's (2004) model of attention capture and transfer (AC\_TEA model). In addition, we observed that behavior varied depending on the AOI. Whereas AOI\_2 and AOI\_7 had a clear, common response across the participants, the behavior in relation to AOI\_1 was diverse. AOI\_1 captured the immediate attention of a

representative percentage of the participants, as evidenced by the large percentage in the second and third positions, whereas another representative portion of the participants were unattracted to it (see the percentages in the sixth and seventh positions). Many participants also looked at AOI\_3 in the second or third positions. The remaining AOIs (4, 5, and 6) occupied the intermediary positions. A study using an Amazon.com-like stimulus found that consumers initially examined product information (product title, image, and descriptions) before turning to ratings (Moriuchi, 2021). We observed this general behavior in our participants in that they glanced at product-related pictures before the ratings. However, we saw that participants focused on ratings (AOI\_3) before product-related information (AOI\_4), perhaps because in the context of food, pictures are sufficiently informative, and for experiential products (e.g., restaurants), the quality assessment is initially more important than further product-related information.

To analyze the time spent fixating on each AOI, we calculated the percentage of time spent looking at all AOIs ( $M = 18.21s$ ,  $SD = 3.11$ ) by measuring the total time spent viewing the stimulus (30s). The results are depicted in Figure 4, which also contains a heat map for one of the stimuli. Although only one such map is provided, the remaining stimuli showed similar distributions. The percentages shown in Figure 4 depict the average value of all 16 stimuli used in the different scenarios.

**[Figure 4 near here]**

## **5 Conclusions**

This study analyzed viewing behavior and the influence of cues in firms' and users' social media posts on consumers' intentions to visit a restaurant and their expected liking of the

experience. Participants viewed four restaurants in a mock-up TripAdvisor social media page, two of which were rated positively and two negatively. We measured visual attention through eye-tracking and subsequently used a questionnaire to ask the participants about their intention to visit and their expectations of liking the four restaurants.

The analyses showed that social media elements had different impacts on consumers' intentions and expectations toward restaurants depending on the UGC valence (RQ2). A closer inspection of viewing behavior revealed that the patterns for social media content were identical, regardless of UGC valence, although with certain particularities (RQ1). Moreover, we noted that, in general, although relevant and salient pictures captured consumers' initial attention, text sustained their attention for longer intervals of time (when controlled for area size; RQ3).

Two main ideas can be generalized for the hospitality industry that will impact users and commercial practices alike. Social media is changing the communication field and appears to be increasingly influential in decision-making in the hospitality industry (Litvin *et al.*, 2018). Users' influence through UGC is ubiquitous. However, social media also allows for the influence of FGC, thereby preserving the need for focused research to improve it (Santiago *et al.*, 2022). Accordingly, both UGC and FGC coexist and compete for consumers' attention. However, how consumers examine the social media content of users and firms alike is the essence of their influence. Our study provides insights into how visual attention influences two outcome variables: visit intention and liking expectations in both positive and negative valence settings.

Previous studies have established a positive relationship between review quantity and restaurant performance rating (Kim *et al.*, 2015). However, the massive amount of content delivered by social media is forcing potential consumers to focus their instant gaze on salient and attractive pictures. Therefore, the visual content is significant in two directions. First, as



proposed by Litvin *et al.*, (2018), social media and the deep selection of pictures should be included in overall marketing and communications strategies. Second, because UGC and FGC compete in the same setting, the weighted influences of both demand targeted research. As such, the actual value of social media is driven by how potential consumers view social media content and how firms strategize in selecting appropriate content.

### 5.1 *Theoretical implications*

In a recent review of studies related to social media in tourism and hospitality journals, Lin *et al.* (2020) have identified UGC as one of the five main lines of research employed. Moreover, the field of tourism and hospitality has demonstrated a steep interest in social media since 2006, and TripAdvisor was identified as a trend in the field, mainly in the hotel industry (Nusair, 2020). Our study therefore contributes to this area by investigating both UGC and FGC in a social media context (i.e., TripAdvisor) for restaurants.

The main theoretical implications of our study concern the influence of social media elements on consumers' viewing behavior and judgments (i.e., their visiting intentions and liking expectations). This is especially pertinent to the tourism, hospitality, and travel sector as it was suggested that economic and social factors would determine consumers' use of social media platforms related to this sector (Chu *et al.*, 2020). Our results revealed that, although our participants viewed all relevant elements, they did not use all to reach a decision. This might be because participants' motivation to assess the reliability of the information and their confidence in the decision-making outcome were not strong enough to overcome the tendency to save cognitive resources (the principle of least effort). Consequently, participants relied on few heuristic cues during their decision-making processes. However, by measuring attention via eye-tracking, we found neurological evidence that consumers employ greater levels of cognitive effort to form opinions when faced with negatively valenced reviews compared to positive ones. This suggests that negatively valenced reviews increase uncertainty about

product/service quality, which requires consideration of additional cues to remedy. This could explain, for example, why consumers search more extensively for competing items when faced with negative reviews (Varga and Albuquerque, 2019).

As to the social media cues that first attract visual attention (RQ3), we found that the participants were initially attracted to the picture, possibly due to its saliency (e.g., colors, content, size) and its location, indicating a bottom-up visualization process. Furthermore, we noted an indication that this initial attention was transferred to the text. However, normalizing for the size of the area of elements, it seems likely that the participants used a top-down process to evaluate the UGC elements, as the time and number of those fixations were especially significant. The social media page also contained a third-party advertisement (AOI\_7). Because AOI\_7 was the last element to be seen, our participants tended to engage in a top-down process and to employ selective attention related to the third-party advertisement. This is a relevant finding to better understand the intersection area of tourism and hospitality with social media and advertising, and warrants further research (Chu *et al.*, 2020). Finally, we also contributed to the theory by providing findings which expand the current models of social media influence based on measurements of actual attention given to the cues. Such an approach has not been addressed to the hospitality domain (Chu *et al.*, 2020).

## 5.2 *Practical implications*

To managers, we would stress the importance of the pictorial element, which tends to attract initial attention, possibly via a bottom-up mechanism. This is especially important as the features of visual content tend to influence several consumer-company behavioral responses (Ballester *et al.*, 2021). Moreover, the restaurant would be in complete control of the pictorial element. We emphasize this element's importance because of the intriguing finding that the picture influenced judgments in opposite directions depending on the UGC's valence. Whereas UGC increases (decreases) intention to visit and expected liking with positive (negative)

valence, pictures evoked the opposite behavior. We interpreted this to mean that the participants perceived the picture as incongruent with the star rating valence. Therefore, our advice is to always pre-test the attractiveness levels of pictures to be posted on social media pages.

UGC also appears to significantly impact consumers' decisions. Our results showed that participants based their judgments on the opinions of others expressed via star ratings, possibly by activating the "consensus implies correctness" heuristic. Importantly, with positive valence reviews, the participants considered only how many others voted on each rating score (i.e., the breakdown of star ratings, AOI\_6) to reach a decision. However, when review valence was negative, participants displayed a need for further restaurant-related data—such as food, service, and value-for-money information—to form their judgments. Knowing that these factors (mainly food) correlate positively with restaurant popularity (Zhang *et al.*, 2010), it is imperative for restaurants to deliver high-quality service in these areas.

Another implication of our study regards the different AOIs. When correcting for area size, we found that UGC elements attracted a significant proportion of the participants' attention. This supports behavioral findings on the importance of considering UGC in marketing strategies (Babić Rosario *et al.*, 2016, 2020; Pourfakhimi *et al.*, 2020). Furthermore, it is crucial that companies using social media for their advertising be fully aware of the selective manner in which their (potential) customers respond to content. We found that the third-party advertisement is the last area viewed, suggesting a deliberate effort by site visitors to ignore advertising. Therefore, companies should diversify their marketing investments across different media and social media platforms and seek innovative advertising formats (e.g., augmented reality) to most effectively capture consumers' attention.

Although we set restaurants as our context, we argue that the implications of this study can be generalized to other sectors of the hospitality industry, such as hotels and other touristic

services (trip packages, attractions). Indeed, the layout of social media platforms for these sectors also includes UGC and FGC, text, and images. Furthermore, the metrics we employed would suitably apply to these sectors as well.

### 5.3 *Limitations and future research*

This study has limitations that must be considered when examining its findings. However, they present opportunities for future research. First, participants viewed the stimuli for a fixed period of time, which would not be the case in real settings due to individual differences in total time spent looking at stimuli. We fixed the time to control for this variable and to obtain consistent eye-tracking data across conditions and participants. However, in so doing, we may have masked some potential differences in viewing behavior between the positive and negative valence conditions and may have influenced information processing. A follow-up study could remove this time constraint in order to assess the reliability of our findings. Second, the participants faced a hypothetical situation, thereby possibly removing any true motivation to perform the task. This could have led them to follow the principle of least effort and form heuristics-based judgments. Future studies might use incentive-compatible tasks to test the reproducibility of our findings. Third, our stimuli did not include written reviews, which, due to their subjective nature, may have been differently interpreted among the participants. Written reviews could potentially moderate the effect of the other page elements on visit intention and liking expectations. A future study might consider testing their potential influence. Fourth, we considered only one platform, TripAdvisor; our findings may not apply to other social media platforms. Moreover, future research could explore attentional patterns of the content elements with different elements and layout configurations. For example, in a TripAdvisor restaurant-based study, Bigne *et al.* (2020) manipulated review comments with or without pictures and showed that the attention participants paid to the review text (identified via gaze patterns) differed depending on the inclusion of a picture. In this vein, other types of

social media platforms that are heavily based on pictures (e.g., Instagram) could be used for further research. Fifth, our statistical analyses were not corrected for multiple testing, which are known to increase type I errors.

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