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Optimizing online hotel ADS: The role of emotional and experiential images and banner placement in capturing visual attention

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ABSTRACT

This study investigates how the type of image used in hotel advertising banners and their position on the web can influence the attentional capture of internet users. Using eye tracking technology, the visual behavior of a sample of 90 participants was recorded while browsing real websites, created ad hoc, with dynamic banners of different formats, positions and images. The results indicate that both the location and type of image are crucial to maximize the effectiveness of the banner ad. Banners incorporating images with faces of people expressing happiness or conveying positive experiences or feelings attract and retain attention more effectively than those showing conventional images of hotel facilities. In addition, the effect of the image on visual attention appears to be moderated by the position of the banner on the web. This study contributes to the field of tourism marketing by providing empirical evidence on ad design and positioning strategies that help combat the phenomenon of banner blindness. The findings offer valuable insights for tourism marketers, enabling them to optimize the visibility and impact of their online advertising campaigns.

1. Introduction

Banner advertising has been one of the most well-known and widely used commercial tools in the digital environment since its emergence in 1997. According to Statista data (2023), spending on banner advertising in the United States, far from decreasing, has risen in recent years, from $36 billion in 2017 to almost $69 billion in 2022. However, its effectiveness has gradually declined despite the availability of more sophisticated technology and tools such as retargeting (Liu-Thompkins, 2019). The CTR (click-through rate) dropped from 7 % in 1996 to 1 % in 2008 (Kuisma, et al., 2010) and was as low as 0.27 % in 2024 (The Online Advertising Guide, 2024).

The declining effectiveness of banners is due to the increasing use of ad blockers (Despotakis et al., 2021), the wider use of mobile devices (where banners are less effective; Boerman et al., 2017) and the advertising saturation to which we are subjected, featuring ads that are sometimes unrelated to our interests (Kaspar et al., 2019). Consequently, we consciously ("physical advertising avoidance") and unconsciously ("cognitive advertising avoidance") try to avoid exposure to online advertising as it disrupts the completion of our desired activity while browsing the internet (Liu et al., 2018). This phenomenon is known as banner blindness (Sapronov and Gorbunova, 2022). "Banner Blindness" refers to a web phenomenon in which users, either consciously or unconsciously, ignore certain elements of a webpage, such as banners. This behavior was first identified in 1998 by Benway and Lane, who observed that users overlooked information presented in banner-like formats, even when it contained relevant links for their tasks. This behavior suggests that users tend to ignore elements they associate with advertising, focusing solely on the information they perceive as relevant to their objectives.

According to Muñoz-Leiva et al., (2019), several studies show that many users do not pay attention to banner ads or, if they do look at them, they do not remember them after having visited a website (e.g., Kuisma et al., 2010; Sapronov and Gorbunova, 2022). Moreover, some studies

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show that users ignore at least half of the visible banners or avoid looking at them (Nielsen, 2007) by using their previous browsing experience to focus on the main content (Hsieh and Chen, 2011). Even when users are forced to look at the website for more than one minute, the percentage of them who remember the brand is low (Hervet et al., 2011; Muñoz-Leiva et al., 2019). Therefore, exposure does not guarantee user attention. However, previous studies suggest that, depending on the banner's design and configuration, it can be processed unconsciously and influence brand attitudes (Lee and Ahn, 2012).

Growing investment in banner advertising as a key retargeting tool, increasing advertising saturation, banner blindness and the steady decline in CTRs, together with the expected removal of third-party cookies from Google's Chrome browser, make banner optimization increasingly important for marketers and advertisers. Given that attracting visual attention to the banner is fundamental to enticing the user to process the stimulus and click on the ad (Drèze and Hussherr, 2003), this research seeks to answer the following questions: a) which types of images improve the effectiveness of hotel advertising communications in attracting and retaining the attention of the observer; b) which images are most liked by potential buyers; and c) which combination of banner position and image type used is most effective in capturing attention? For this purpose, a controlled experiment was carried out with real websites and hotel advertising, recording the visual behavior of users using eye tracking technology.

Despite the growing importance of digital advertising in the hospitality sector, empirical research on the effectiveness of banner ads in this context remains limited. While previous studies have examined factors such as banner size (e.g., Cho, 2003; Robinson et al., 2007), position or format (e.g., Simonetti and Bigne, 2024; Li et al., 2016; Kuisma et al., 2010), diseño del mensaje (e.g., Kushwaha et al., 2022), animation (e.g., Oliveira and Pettrol, 2022; Simola et al., 2011; Hamborg et al., 2012), or personalization (Bang and Wojdynski, 2016; Kim and Jeong, 2023; Köster et al., 2015), including in tourism-related environments (Muñoz-Leiva et al., 2019) only one study has analyzed the impact of banner placement on visual attention within a hotel website using eye-tracking technology (Muñoz-Leiva et al., 2021). However, that study focused solely on the effect of banner position on attention and recall, without considering other design variables such as the type of image used.

The present study addresses this gap in the literature through several key contributions. First, it provides a comparative analysis of the impact of three types of images—functional (e.g., hotel façade or pool), commonly used in hotel advertising; emotional (smiling faces); and experiential (e.g., relaxing or beach scenes)—on the ability to capture and retain user attention. Second, it explores the interaction between image type and banner position on the website, offering insights into how these variables jointly modulate users' visual behavior. Third, it incorporates both attentional behavior measures and psychophysiological responses—specifically, pupil dilation—which provide complementary information about the emotional activation or appeal elicited by each type of image. Finally, the study combines a high degree of experimental control with strong ecological validity. By developing four fully functional, custom-built websites, the study recreates a naturalistic browsing task in which participants navigate freely through digital content while the web content, banner placement, and banner design are experimentally controlled. The findings reveal which combination of image type and banner position is most effective in capturing and retaining user attention. This work makes significant academic contributions to the field of tourism management by supporting the effective design and implementation of hotel advertising in a highly competitive environment.

2. The effectiveness of banner advertising

The effectiveness of banner advertising has been analyzed from different perspectives: a) at the perceptual level, measured through brand awareness, recognition or recall (e.g., Nihel, 2013; Muñoz-Leiva et al., 2019); b) at the cognitive and attitudinal level, measured through beliefs and attitudes towards the brand (e.g., Pieters et al., 2010); c) at the behavioral level, measured through CTR or conversion rate (e.g., Kaspar et al., 2019); and d) at the attentional or information processing level, quantified according to the time spent looking at an ad (e.g., Kaspar et al., 2019; Sapronov and Gorbunova, 2022).

In this research, we focus on the attention-based conception of effectiveness. People have limited cognitive capacity. We are not able to process all the information that surrounds us (Boardman, et al., 2022). It is the cognitive process of attention that allows focus neural resources to process stimuli that we deem relevant. Without visual attention, it is unlikely that recognition and recall will occur, attitudes towards the brand will be forged, or that the ad will be clicked on (Drèze and Hussherr, 2003). In fact, previous studies link visual attention to click-through rates (e.g., Egner et al., 2018). However, advertising banners often fail to be noticed by the user, and are ignored and avoided (Sapronov and Gorbunova, 2022). To combat banner blindness, it is essential to capture the user's visual attention.

Influence of image on banner effectiveness

2.1. The image of hotel accommodation

In the hotel industry, images of an establishment are an important predictor of a customer's sentiment towards it, and even of the likelihood of selecting it as they are an important source of information about the service offered. Displaying attractive images of the hotel is an effective strategy to help decrease the risk associated with the intangibility of the service (Baek and Ok, 2017).

Despite the fact that the strategies of some brands in the accommodation sector focus on price, previous studies show that consumers rely on other information resources when making a purchase decision. In fact, Noone and Robson (2014) suggest that a "good price" may not be enough to compensate for a poor image of the hotel among other potential candidates during the information search process. Despite its importance, there has been little research on the impact of images in the online travel industry (Overgoor et al., 2018). Noone and Robson (2014) analyzed the online hotel booking decision process and the importance of different types of information in making the decision. The results showed that the hotel image was vital not only because it was the most "looked at" information resource by customers, but also because it influenced the pre-selection of "candidate" hotels, and was especially crucial in the final decision phase.

Overgoor et al., (2018) also emphasize the importance of hotel images in the booking decision. These authors were able to predict the number of times hotels would be selected by analyzing their images with artificial intelligence. In addition, when correlating the type of image with the CTR, they found high and positive associations with images of the hotel's rooms, façade or exterior. Images showing views from the hotel or its interior had a lower impact. Taken together, all of this research illustrates the importance of imagery in presenting the establishment in an appealing way in the online environment (Lin, 2016) and its ability to influence consumer behavior.

2.1.1. Images with emotional or experience-based content

As is evident from the study by Overgoor et al., (2018) hotel establishments advertise using images of the hotel itself (for example, the hotel façade) or of the services or facilities they have (the swimming pool, the rooms or the lobby). However, beyond these functional images, emotional images are often used in advertising to create stronger connections with consumers. Emotional images refer to visual stimuli that evoke affective responses in the observer, often associated with positive or negative emotions (Bradley et al., 2011). Prior research suggests that emotional content enhances attention capture and retention due to its affective salience (Bradley et al., 2008). Specifically, images depicting social interactions, facial expressions (particularly smiling faces), and

emotionally charged experiences tend to generate stronger cognitive and emotional engagement (Calvo and Nummenmaa, 2016; Casado-Aranda et al., 2022). This approach to using emotional images contrasts with more traditional advertising strategies based on functional arguments. In other words, they use utilitarian advertising featuring functional arguments or information on the benefits that the buyer would obtain by acquiring the service. In this regard, in recent years there has been debate about the increased effectiveness of functional banners versus hedonic banners, i.e., those that emphasize emotional or experience-based benefits (Couwenberg et al., 2017).

Although previous studies (e.g., Bilgihan and Bujisic, 2015; Samuelsen and Olsen, 2010) have highlighted that utilitarian arguments are more decisive than hedonic arguments, they relate to situations with important consequences or products that offer utilitarian benefits. On the contrary, in a situation with minimal consequences, when faced with a task that does not require making important decisions, such as freely browsing the internet, the consumer evaluates the information more superficially and is driven by emotional arguments (Petty et al., 1997). In these circumstances, hedonic arguments may be more effective.

In this regard, Casado-Aranda et al. (2022) compared the effectiveness of utilitarian banners versus hedonic banners. Using functional magnetic resonance imaging, they demonstrated that the hedonic banner used was more effective than the utilitarian banner because it provoked greater brain activation in areas related to memory encoding and retrieval. According to Motoki et al. (2020) the effectiveness of either type of banner depends on the need covered by the product. If the need is hedonic, such as booking vacation accommodation, emotional advertising will be more effective.

In general, appealing to emotions as an advertising strategy has been shown to promote brand recall and positive attitudes towards the brand and purchase (Bakalash and Riemer, 2013). In the tourism field, research suggests that emotion-evoking arguments are more effective (Ali et al., 2016; Prayag et al., 2017). The importance of emotions in the behavioral intentions of tourists has been demonstrated (e.g., Volo, 2021) and it has been shown that the connection between emotions and consumption is stronger and more direct when it comes to hedonic or vacation-related services (Bagozzi et al., 2002). As a consequence, destinations are increasingly focusing on tourism campaigns that evoke emotions (Prayag et al., 2017).

Cognitive psychology supports the notion that emotional stimuli with special adaptive value are biologically and socially significant (Fernández-Martín et al., 2017). To ensure that these stimuli are perceived among others, evolution has equipped humans with parallel processing mechanisms that automatically detect signals suggesting there a potential threat or opportunity (Fernández-Martín et al., 2017). In other words, our attention automatically and unconsciously captures and encodes emotional visual stimuli outside our main focus of attention, in order to redirect our gaze and adequately process this information even when it is irrelevant to our current task (Fernández-Martín et al., 2017). More specifically, it has been shown that people are more likely to look at images with positive emotional content (of children, families, adventure or sport) than at images with negative or neutral emotional content (Calvo et al., 2015).

Applying this knowledge to the design of banners to enhance their ability to capture and retain the viewer's attention, it would make sense to use images with positive emotional content related to accommodation services. An example could be photographs that convey feelings or experiences. Shin et al. (2020) describe them as images that show consumers as they are interacting with the hotel environment in a way that highlights the more intangible elements of a service experience.

Based on previous results obtained in the existing literature on a) our ability to automatically detect and process emotional stimuli in our peripheral vision (Fernández-Martín et al., 2017); b) our tendency to prioritize looking at positive emotional stimuli (Calvo et al., 2015) and c) the higher effectiveness of hedonic versus functional banners (Cancela et al., 2021; Casado-Aranda et al., 2022; Motoki et al., 2020), H1 is proposed.

H1: Banners with images that convey positive consumer feelings or experiences are more effective in attracting and retaining the viewer's visual attention than functional banners with product-based images (hotel façade, swimming pool, etc.).

2.1.2. The inclusion of happy faces in the image

Another effective way of attracting attention and transmitting emotions through ads is to include the emotional stimuli par excellence: human faces. Cognitive psychology has already shown that the mere presence of people in an image, especially faces, affects the observer's gaze and entails a stronger ability to process a scene (e.g., Humphrey and Underwood, 2010). In digital advertising, Sajjacholapunt and Ball (2014) suggest that including human faces in ads improves banner effectiveness by capturing more attention and enhancing recall. Their results are consistent with those of Djamasbi et al. (2010) and Muñoz-Leiva et al. (2019).

Due to their social and emotional significance, faces have the ability to attract visual attention automatically and faster than any other "non-social" stimuli (Palermo and Rhodes, 2007; Langton et al., 2006). In fact, this natural tendency to look at faces has been found in infants as young (Hood et al., 1998; Ristic et al., 2002) and in adults (Friesen and Kingstone, 2008). According to Ro et al., (2001) faces have a biological significance that attracts the attention of observers.

More specifically, it has been demonstrated how the enormous power of a smile, compared to the rest of the emotional facial expressions, can capture visual attention unconsciously and convey confidence to the observer (Calvo and Nummenmaa, 2016; Fernández-Martín et al., 2017). It is a facial expression with two characteristics that make it unique. It is very prominent at the perceptual level, which allows it to have an enormous capacity to attract the observer's gaze, and it is a diagnostic feature, i.e., it is a unique and unmistakable facial expression associated with an emotional expression of happiness, making it easy to recognize.

Based on previous literature advocating the advantages of including human faces in the image of ads (Sajjacholapunt and Ball, 2014) and the potential of happy facial expressions (Calvo et al., 2017; Fernández-Martín et al., 2017), H2 is proposed.

H2: Banners with images that include people with happy facial expressions and gazes directed at the product or offer are more effective at attracting and retaining the observer's visual attention than functional banners with product-based images.

2.2. Influence of position and format on banner effectiveness

It is well known that the user's visual attention is not evenly distributed when browsing a website (Bigne et al., 2021; Simonetti and Bigne, 2022). Banners located at the top of the website are looked at more frequently (Ispir et al., 2023; Muñoz-Leiva et al., 2019). According to Navalpakkam et al. (2013), banners located at the top of the website received 65 % of the attention while those located in the middle and bottom only received 15 % and 5 % respectively. In addition, the research demonstrates other important effects that the position of the advertising banner has on its effectiveness. Those placed in the first third of the web page achieve a higher CTR (Simonetti and Bigne, 2024) and are better remembered than those placed at the bottom (Nihel, 2013).

When analyzing the type of banner, although Li et al. (2016) and Kuisma et al. (2010) agree that format does not affect recall or attitudes towards the banner, results differ in terms of visual attention. According to Kuisma et al. (2010), since horizontal banners are the most used format in online advertising, users expect ads to be located at the top of the web page, so they learn to avoid them more easily than when it comes to vertical banners. In contrast, Li et al. (2016) and more recently Ispir et al., (2023), have demonstrated that horizontal banners located at the top capture more attention than vertical banners located at the bottom of the page and to the right. In this regard, it has been found that

banner blindness is more frequent when ads are placed on the right side of the web environment (e.g., Owens et al., 2011; Resnick and Albert, 2014). According to Djamasbi et al. (2010) users prioritize the processing of information located on the left side over the right due to how our brains are organized and how we learn (e.g., Calvo et al., 2015).

Although no clear reason has been found to explain the differences in eye behavior between the studies of Kuisma et al. (2010) and Li et al. (2016), it has been posited that the user's goal or objective and, consequently, the way in which he or she browses the internet, may have influenced the visual scanning patterns in both studies. If users do indeed aim to search for specific information on the internet that has nothing to do with ads, they will most likely avoid areas of the screen that typically contain advertising, since ads are perceived as an obstacle in their search for information (e.g., Simola et al., 2011; Resnick and Albert, 2014). Conversely, when users perform simple searches (less demanding ones, such as freely browsing), they do not need to pay full attention to the task, and can therefore perceive and process other stimuli such as ads (Burke et al., 2005) and remember them better (Ispir et al., 2023). Based on existing literature, it is hypothesized that position influences the user's attention when freely browsing general information websites in the following way:

H3: Advertising banners placed at the top of the website will attract and retain the visual attention of observers more than those banners placed in the middle or bottom area of the page.

2.3. Interaction between banner image and position: a neurocognitive attention perspective

Understanding how users allocate attention to banner ads during web browsing can be enriched by neurocognitive models of attentional processing. In particular, the dua l-network model of attention proposed by Corbetta and Shulman (2002) provides a useful framework. This model distinguishes between two attentional systems: the ventral system, which responds to salient and unexpected stimuli in a bottom-up, stimulus-driven manner; and the dorsal system, which supports top-down, goal-directed attentional control based on the observer's intentions or expectations.

This theoretical distinction has important implications for digital advertising: stimuli with strong emotional or perceptual salience—such as smiling faces (e.g., Calvo and Nummenmaa, 2016)—are more likely to activate the ventral attention network and automatically capture attention during the early, unstructured stages of web browsing. Conversely, as users engage in more task-oriented or goal-driven navigation, the dorsal system may exert greater influence, directing attention toward personally relevant information—such as content that conveys experiences or sensations. In this regard, studies by Cancela et al. (2021) and Huskey et al. (2020) have linked more elaborate cognitive processing with increased attention and memory for hedonic design elements.

Further support for this distinction comes from the model proposed by Buschman and Miller (2007), which also differentiates between bottom-up and top-down attention based on their neural mechanisms. According to their framework, bottom-up attention involves sensory-driven brain regions that respond to stimulus salience, while top-down attention is regulated by frontoparietal circuits that reflect internal goals. Together, these models suggest that the effectiveness of advertising stimuli may depend not only on what is shown (image content), but also on where and when it appears within the attentional sequence of the user's interaction with the website. Based on these theoretical models, P4 is proposed:

P4: the position of the banner moderates the effectiveness of the image (product-based, happy facial expressions or experience-based) in attracting the viewer's attention.

3. Methodology

3.1. Sample

To test the hypotheses of this study, an experimental design was implemented with a sample of 102 participants (50 % women), aged between 30 and 60 years, and with a medium-high income level. This age and economic profile was selected in accordance with the objective of analyzing advertising effectiveness among the target audience of four- and five-star hotels—the category to which the establishments advertised in the analyzed banners belonged.

Participants were recruited through a market research company, which conducted a pre-screening survey to ensure that they met the inclusion criterion of having stayed at least once per year in a four- or five-star hotel during the past three years. As an incentive, each participant received a €30 compensation. Besides, the market research company holds Information Security and Privacy certifications: ISO 27001 and ISO 27701, ensuring the proper selection of the sample in terms of both representativeness and adherence to the inclusion criteria.

To ensure data quality and following recommendations from previous research (Holmqvist et al., 2011; Orquin and Holmqvist, 2018), data from participants whose eye calibration error exceeded 0.5° of visual angle or whose tracking rate during the test was below 90 % were excluded from the analysis. As a result, the final sample consisted of 90 individuals.

3.2. Instrument

To carry out the study, eye tracking techniques were employed, and a RED 500 eye tracker from SMI (Sensomotoric Instruments) was used. The system is a device that is placed next to the screen or monitor that the person will use to browse the internet. This device captures the participant's gaze at a frequency of 500 Hz and with accuracy of less than 0.4 degrees of visual angle (about four millimeters at a distance of 70 centimeters between the participant and the screen). The eye tracker, through its Begaze software, makes it possible to know where each participant looks, in what order and for how long. In addition, it records pupil dilation and mouse clicks when the user browses websites. Previous studies analyzing attention and perception of banners utilize the eye-tracking technique (Lee and Ahn, 2012; Hervet et al., 2011 or Resnick and Albert, 2014).

3.3. Materials and study design

To test the hypotheses of this study, four fully functional websites covering general current events (political, economic, social, etc.) were created. The content and structure of these websites were identical for all participants, ensuring that potential differences in visual attention were not influenced by variations in webpage content. Participants could browse the websites normally and click on any content (news or advertising). In each of the websites, nine dynamic banners were included (five test banners and four filler banners related to sectors other than tourism) in a typical website layout. Of the test banners, two were horizontal, two vertical and there was one right rail banner. All the websites had banners in the same location and of the same size. The placement and size of all banners were identical across all versions of the websites, ensuring uniform exposure conditions.

A total of 30 banners were created to test the effects of the image and the position/format on attention. In order to study the most effective type of image for a banner, three groups of ten creative materials were compared, each with different types of images: A) images of the exterior of the hotel or its swimming pool (typically used); B) close-up images of the faces of a smiling person or couple; and, C) images that conveyed feelings and experiences, such as a body sunbathing in the sand or on a lounger cushion, feet walking on the sand, a person or couple (from behind) enjoying a sunset, a person swimming, etc. While both types B

and C were selected for their capacity to evoke positive emotions or sensations, the key difference lies in the presence or absence of facial expressions. Type B images include genuine expressions of happiness through smiling faces, whereas type C images aim to elicit positive emotional responses by depicting pleasurable actions or situations without showing any facial expressions. To ensure that any observed effects on visual attention were exclusively due to the image, all other elements of the banners remained identical across conditions: the brand, the slogan, the call to action, and the offer/promotion (if applicable).

Participants were randomly assigned to the three different groups. Each group accessed the same web pages (Website 1 to Website 4) with a different banner type (A, B or C) and placement/format (Th= top horizontal placement; Tf= top right rail; Mv= middle vertical; Mh= middle horizontal; Bv= bottom vertical). All banners were displayed the same number of times across all conditions, both in terms of webpage appearance and position. No group viewed the same banner twice. If one group was presented with a banner with a hotel/pool image, the other two groups were presented with the same banner (brand, slogan, offer and call to action), on the same website and in the same position/format, but with the image of a model with a smiling face (type B) or an image portraying experiences or feelings (type C). This design ensured strict experimental control, eliminating potential confounds related to banner placement, webpage content, or differences in banner wording. It is important to note that the exposure time of each banner was not fixed, but rather depended on each participant's navigation behavior and the degree to which banners became visible during scrolling.

Although participants navigated each website for a maximum of three minutes, exposure to the banners was not fixed but dependent on scrolling behavior. To minimize potential advertising fatigue, banner presentation was counterbalanced across participants, and all websites featured varied, general-interest content. Given that participants could explore freely and that the advertising was relevant to their profile, the likelihood of fatigue effects influencing attention patterns was substantially reduced.

3.4. Process

Once the four web pages and the 30 banners described above had been created, the market research company was asked to summon the study participants to the laboratory. After the participants had agreed to participate and signed the informed consent document, they went to the room which contained a computer with an internet connection and eye tracker equipment and received the following instructions:

"Next, you will be presented with four websites. They will open one at a time. Just browse freely through each of them, just as you would normally do at home or at any other time. You can read whatever you like and click wherever you want. After a few minutes the website will close, a message will appear telling you to browse freely through another website and after ten seconds the next website will open. The study will take approximately 20 min. If at any time you have any questions, do not hesitate to ask me".

Once all questions had been answered, the calibration process began between the eye tracker and the participant's gaze (approximately 30 s). Once the calibration was complete, the participant pressed the space bar, and the first website appeared. When the participant had freely browsed through the four web pages for three minutes each, he or she was asked to answer sociodemographic questions (sex and age), consumer habits (frequency of stays at hotel accommodation and its category) and recall (evoked and suggested). At the end of the test, the participant was accompanied to the entrance, thanked for his or her collaboration and given the reward. This was a dinner at the hotel chain that had sponsored the study, plus a gift featuring typical local food products.

Four ocular behavior variables were recorded: a) pupillary dilation (mm); b) the number of fixations that were carried out on each advertising banner (fixation count); c) the total time (ms) during which they were looked at (dwell time); and d) the number of times they were revisited (revisits). A revisit is counted as such when, for example, a participant looks at banner X, then looks at any other information element on the website, and then looks at banner X again. At that point it is understood that banner X has been revisited once.

4. Results

In order to find out which position/format of the advertising banners was more effective in attracting and retaining the visual attention of the observers, an analysis of variance (ANOVA) was carried out, taking as dependent variables the three measurements of eye movements recorded (number of fixations, dwell time and revisits) and the position/format of each banner (five types) as a factor. The results showed evidence of a significant effect of banner position/format on the number of fixations, $F_{(4,\ 2770)}= 28.91$, $p < .000$, $\eta^2 = .40$; the dwell time, $F_{(4,\ 2770)}= 29.40$, $p < .000$, $\eta^2 = .41$; and revisits, $F_{(4,\ 2770)}= 7.29$, $p < .000$, $\eta^2 = .37$. According to Cohen's (1988) guidelines, these effect sizes suggest a large impact of banner position on visual attention. Specifically, the high η^2 values indicate that banner placement plays a crucial role in determining the number of fixations, total dwell time, and revisits, highlighting the importance of banner positioning in capturing and retaining user visual attention.

Table 1 presents the descriptive statistics (mean and standard deviation) of the different positions regarding the dependent variables. As can be seen in Table 1, the post hoc analysis (applying Bonferroni adjustments) showed similar differences in variables of dwell time and number of fixations. Therefore, the banner with top right rail position/format was viewed more times (mean=2.36) and for longer than the rest of the banners (mean = 629.14 ms; $p < .000$). The top horizontal and middle vertical banners were not only subject to a higher number of fixations than the bottom horizontal ($p < .01$ and $p < .05$ respectively) and bottom vertical ($p < .05$) banners, but were also looked at longer than the bottom horizontal ($p < .01$) and bottom vertical ($p < .05$ and $p < .01$) banners.

DT: Total time the banner has been viewed (ms); R: Number of times the banner was revisited; FC: number of fixations that were carried out on each advertising banner

Multiple comparisons showed that the right rail banner was also revisited more times than the middle vertical ($p < .05$), bottom horizontal ($p < .000$) and bottom vertical ($p < .000$) banners. No significant differences were evident in the remaining comparisons. In general, the results show that the banner with the top right rail position and format is the most effective in capturing and retaining attention for the longest time (confirming H3).

In order to address H1 and H2 and to determine which type of image used in the design of advertising banners is more effective in attracting and retaining the visual attention of observers, an analysis of variance (ANOVA) was carried out using as dependent variables the three measurements of eye movements recorded (number of fixations, dwell time and revisits) and the type of image (hotel/pool, faces, feelings) as a factor. The results showed an effect of the type of banner image on the number of fixations, $F_{(2,\ 1382)}= 4.79$, $p < .01$, $\eta^2 = .01$; and the dwell time, $F_{(2,\ 1382)}= 4.04$, $p < .05$, $\eta^2 = .01$. There was no effect on the revisits variable, $F_{(2,\ 392)}= 2.24$, $p = .108$, $\eta^2 = .01$. Although the effect of image type on dwell time and fixation count was statistically significant, the effect sizes ($\eta^2 = .01$) suggest a small but meaningful impact of emotional and experience-based images in attracting and retaining visual attention.

As can be seen in Table 2, the post hoc analysis (applying Bonferroni adjustments) showed that both banners with images that conveyed feelings and those showing faces with happy expressions received more fixations ($p < .05$) and were looked at for longer ($p < .05$) than banners with images of hotels and swimming pools. In other words, banners with these two types of images are able to attract and retain more attention than banners typically used as creative materials that feature images of

Table 1
Analysis of variance (ANOVA).

		Average	SD	Post hoc comparisons	Partial η^2
Dwell time (ms) (DT)	A. Top horizontal	288.22	833.22	D(**), E(*)	0.41
	B. Top right rail	629.14	1662.40	A(***), C(***), D(***), E(***)	
	C. Middle vertical	279.96	765.82	D(*), E(*)	
	D. Middle horizontal	95.87	383.03	-	
	E. Bottom vertical	108.71	416.35	-	
Revisits (R)	A. Top horizontal	.93	1.639	-	0.37
	B. Top right rail	1.38	2.655	C(*), D(***), E(***)	
	C. Middle vertical	.79	1.164	-	
	D. Middle horizontal	.45	1066	-	
	E. Bottom vertical	.42	.864	-	
Fixation Count (FC)	A. Top horizontal	1.16	3.134	D(**), E(*)	0.40
	B. Top right rail	2.36	5.512	A(***), C(***), D(***), E(***)	
	C. Middle vertical	1.21	3.104	D(**), E(**)	
	D. Middle horizontal	.46	1.656		
	E. Bottom vertical	.53	1.854		

Table 2
Analysis of variance (ANOVA).

		Average	SD	Post hoc comparisons	Partial η^2
Dwell time (ms) (DT)	1. Hotel/pool	224.24	775.04	-	.01
		393.75	1325.70	A(*)	
	2. Faces	397.57	1066.19	A(*)	
	3. Feelings				
Revisits (R)	4. Hotel/pool	.76	1.765	-	.01
		1.25	2.296	-	
	5. Faces	1.15	1.678	-	
	6. Feelings				
Fixation count (FC)	7. Hotel/pool	.93	2.787	-	.01
		1.58	4.503	A(*)	
	8. Faces	1.64	4.311	A(*)	
	9. Feelings				

DT: Total time the banner has been viewed (ms); R: Number of times the banner was revisited; FC: number of fixations that were carried out on each advertising banner.

hotel establishments (confirming H1 and H2).

To find out which type of image used in the design of the advertising banners generated more interest or satisfaction among the observers, an analysis of variance (ANOVA) was carried out, taking as the dependent variable the pupil dilation measurement (in millimeters) and the type of image (hotel/pool, faces and feelings) as a factor. The results demonstrated an effect of the type of image on the pupillary dilation of the observers, $F_{(2,\ 1382)}= 4.79$, $p < .01$, $\eta^2 = .03$. The effect size ($\eta^2 = .03$) suggests that the impact of image type on pupillary dilation is small to moderate (Cohen, 1988), indicating a measurable but limited physiological response to emotional and experience-based images.

As can be seen in Table 3, the post hoc analysis (applying Bonferroni adjustments) showed that banners with images that conveyed feelings were linked to greater pupil dilation than banners with images of happy faces ($p < .000$). In turn, both images conveying feelings and images of happy faces were linked to greater measurements of pupillary dilation than images of hotels and swimming pools ($p < .000$ and $p < .01$ respectively). The data suggest that images conveying feelings, followed by those showing smiling people generate more interest or are more liked by observers than images of hotels (confirming H1 and H2).

With respect to proposition 4 (P4), we also sought to determine whether the effectiveness of the different types of images used in the banners in attracting and retaining the observer's attention varied according to the position of the banner, whether the banners were visible when the website was opened (those located at the top of the website) or whether they became visible later on when the participants explored the middle and bottom areas of the website. For this purpose, analyses of variance (ANOVA) were carried out according to the location of the banners (top versus middle and bottom), taking as dependent variables the three measurements of eye movements recorded (number of fixations, dwell time and revisits) and the type of image (hotel/pool, faces, feelings) as a factor.

Table 3
Analysis of variance (ANOVA).

		Average	SD	Post hoc comparisons	Partial η^2
Pupil Dilation (PD)	A. Hotel/pool	3.52	.59	-	.03
	B. Faces	3.62	.50	A(**)	
	C. Feelings	3.73	.50	A(***), B(***)	

PD: Pupil Dilation (mm)

The results showed an effect of the type of image of the top horizontal and right rail banners on the number of fixations, $F_{(2,\ 557)}= 3.58$, $p < .05$, $\eta^2 = .01$; and the dwell time, $F_{(2,\ 557)}= 3.26$, $p < .05$, $\eta^2 = .01$. There was no effect on the revisits variable, $F_{(2,\ 231)}= 2.57$, $p = .079$, $\eta^2 = .02$. As can be seen in Table 4, the post hoc analysis (applying Bonferroni adjustments) showed that, when the banners are located at the top of the website (top horizontal banner and top right rail), those with images showing faces with happy expressions are more effective than banners with images about the product (they obtain more fixations ($p < .05$) and were looked at for longer ($p < .05$). No other significant differences were noted.

DT: Total time the banner has been viewed (ms); R: Number of times the banner was revisited; FC: number of fixations that were carried out on each advertising banner.

As can be seen in Table 5, the results showed an effect of the type of image of the middle vertical, bottom horizontal and bottom vertical banners on the number of fixations, $F_{(2,\ 557)}= 4.04$, $p < .05$, $\eta^2 = .01$; and the dwell time, $F_{(2,\ 557)}= 4.01$, $p < .05$, $\eta^2 = .01$. There was no effect on the revisits variable, $F_{(2,\ 231)}= 1.39$, $p = .253$, $\eta^2 = .02$. Post hoc analysis (applying Bonferroni adjustments) revealed that, unlike the previous case, banners with images conveying feelings or experiences received more fixations ($p < .05$) and were looked at for longer ($p < .05$) than banners with images of hotels and swimming pools. No other differences were noted.

According to these results, advertising images with smiling models would be more effective in attracting and retaining the visual attention of observers when the creative material is displayed upon opening the web page (banners located at the top), while creative materials with images conveying feelings or experiences would be more effective when the advertising is seen while the participant is actively exploring the web environment (banners located at the middle or bottom).

To test the effect of images on attention, as well as the moderating effect of banner position/format, a mediation analysis was conducted through the PROCESS macro (SPSS 26; mediation model 1; Hayes 2018; Fig. 1). Where the independent variable (X) is the banner image (hotel/smiling faces/feelings), the dependent variable (Y) is dwell time, and the mediator variable is banner placement/format (top placement versus middle placement/bottom placement).

This measurement analysis confirmed a direct effect of images on

Table 4
Analysis of variance (ANOVA): Top horizontal banner and top right rail.

		Average	SD	Post hoc comparisons	Partial η^2
Dwell time (ms) (DT)	A. Hotel/pool	367.44	1099.64	-	.01
		751.59	1946.25	A(*)	
	B. Faces	585.66	1251.04	-	
	C. Feelings				
Revisits (R)	D. Hotel/pool	.87	2.11	-	.02
		1.68	2.75	-	
	E. Faces	1.18	1.77	-	
	F. Feelings				
Fixation count (FC)	G. Hotel/pool	1.44	3.79	-	.01
		2.83	6.33	A(*)	
	H. Faces	2.26	4.92	-	
	I. Feelings				

user attention. Images of faces have a direct and 95 % significant effect on attention (direct effect =743.29; SE=235.00; p = .00; CI: 282.29, 1204.30), while images conveying feelings do not have a significant direct effect (direct effect =292.97; SE=234.00; p = 0.21; CI=-166.0831; 752.0239). Placement/format also has a significant effect on attention (-240.82; SE=97.34; p = .01; CI=-431.79, −49.85). An interaction effect is observed for the mediator variable (X*W; F=3.56; p = .02), indicating that it is not possible to interpret the effect of the independent variable (the image) on the dependent variable alone, since the effect depends on a third variable (Fritz and Arthur, 2017) (the banner placement) (confirming P4).

When analyzing the conditional effect of banners positioned in the top area (top horizontal and top right rail), images of faces (indirect effect = 348.14; SE=108.64; p = 0.00; CI=171.02, 597.26) and those conveying feelings (indirect effect = 218.22; SE=108.17; p = 0.04; CI=6.01, 430.42) are the ones that significantly affect user attention. Faces have the strongest effect. The average difference is significant (F=6.31; p < 0.00). For condition 2 (middle-low position), the ones that get the most attention are images conveying feelings, although the difference is not significant (F=1.45; p = .23).

Fig. 2 represents the dwell time for each image (hotels; Smiling faces; positive feelings/experiences) according to the position on the website (top; middle-bottom). In top position, images of faces obtain the highest dwell time, followed by feelings, while in the middle-bottom position, it is feelings that obtain the highest average number of fixations.

5. Discussion and conclusions

Fragmentation, increasing advertising saturation, huge and growing online ad spend, the imminent removal of cookies from Google's Chrome browser and declining CTRs, make the optimization of creative materials increasingly important for digital marketers and advertisers, especially when the level of competition is as high as it is in the hotel industry. This paper aims to determine to what extent aspects such as the type of image used in its design or the position of the banner in the web environment influence the effectiveness of hotel advertising. In particular, if these variables affect the ability of the banner to attract and retain the visual attention of the observer and consequently combat the dreaded banner blindness. For this purpose, an experimental study was carried out in which the participants, regular guests at four and five star hotel establishments, browsed freely through different general information websites in which dynamic banners on hotel chains appeared, placed in different positions and with different formats. The eye behavior of participants was recorded using eye tracking technology.

When analyzing the effect of the image on attention, the results of this research show that banners with images that convey positive experiences or feelings, and those that include faces expressing happiness, are able to attract and retain more visual attention than standard banners, commonly used by the hotel industry in their creative materials, featuring images of the hotel façade or swimming pool. These results are consistent with the previous findings of Fernández-Martín and Calvo (2016) and Calvo et al. (2015). These works demonstrated our greater ability to process emotional stimuli in our peripheral vision, i.e., before being looked at directly. As a consequence, according to the authors, the probability of directing our visual attention to emotional stimuli and looking at them for a longer time increases. Furthermore, the results are also consistent with Casado-Aranda et al. (2022) and Cancela et al. (2021) regarding the superiority of hedonic banners over utilitarian ones, and with previous studies that highlighted the importance of emotions in tourist behavior (e.g., Volo, 2021), especially when it comes to hedonic or vacation-related services (Bagozzi et al., 2002).

Banners featuring experience-based images, and to a lesser extent those with faces, have been shown to evoke emotions and be more attractive, as demonstrated by greater pupil dilation among observers. In this sense, previous research has shown that pleasurable images not only attract more fixations and encourage visual exploration of the stimulus (Bradley et al., 2011), but also cause increased pupillary dilation (Bradley et al., 2008). These results reinforce the theoretical link between the processing of emotional stimuli and advertising effectiveness, particularly in hedonic service contexts such as tourism (Casado-Aranda et al., 2022), where emotional appeals play a central role in decision-making (Ali et al., 2016; Prayag et al., 2017). From an applied perspective, these findings suggest the value of incorporating emotionally rich images into hotel advertising strategies in order to maximize user engagement and counteract the phenomenon of banner blindness.

In relation to the effect of banner placement in the web environment, the results showed that the "right rail" location/format received more attention than all other options, followed by the top horizontal and middle vertical formats. In this regard, the findings help shed light on the contradictory results found in the literature regarding the advertising effectiveness of banners. It is confirmed that banners located at the top of the website are looked at more frequently (Ispir et al., 2023; Navalpakkam et al., 2013; Muñoz-Leiva et al., 2019). More specifically,

Table 5
Analysis of variance (ANOVA) middle vertical, bottom horizontal and bottom vertical banners.

			Average	SD	Post hoc comparisons	Partial η^2
Dwell time (ms) (DT)	A. Hotel/pool		126.62	1099.64	-	.01
		B. Faces	151.61	1946.25	-	
		C. Feelings	270.09	1251.04	A(*)	
Revisits (R)	A. Hotel/pool		.59	1.04	-	.02
		B. Faces	.66	1.24	-	
		C. Feelings	.98	1.55	-	
Fixation Count (FC)	A. Hotel/pool		.58	1.74	-	.01
		B. Faces	.73	2.28	-	
		C. Feelings	1.21	3.80	A(*)	

DT: Total time the banner has been viewed (ms); R: Number of times the banner was revisited; FC: number of fixations that were carried out on each advertising banner.

the increased effectiveness of banners in a right rail format/position, in comparison to horizontal banners located in the top part of the website is consistent with the previous findings of Kuisma et al. (2010). According to these authors, horizontal banners are used more frequently in online advertising, meaning that users get used to seeing them and learn to avoid them. However, the superiority of the right rail over the top horizontal banner contradicts the results of Li et al. (2016).

In our study, the analysis of participants' scan paths revealed that many users relied on the navigation menu to explore the website. This menu was located directly below the top horizontal banner, which likely brought users' gaze closer to that advertising space and increased the likelihood of it being viewed. Despite this contextual factor that could have favored the visibility of the top banner, the top-right banner received significantly more visual attention. This reinforces the robustness of our findings and aligns them with those of Kuisma et al. (2010), even in a setting where the web design could have favored the top horizontal banner. It is worth noting that placing the navigation menu at the top of the page is a common feature in web design and not exclusive to our experimental setup. In fact, the websites used in our study were developed by a professional firm following realistic and widely adopted web design standards.

This research went further by jointly analyzing the position of the banner in the web environment and the content of the image, which represents a significant contribution from an academic perspective and for the effective management of banners. The results indicate that banner position had a considerably larger effect on visual attention than image type, as evidenced by the higher effect sizes (η^2 =.40 –.41 for position vs. η^2 =.01 –.03 for image type). This suggests that while image content plays a role in engaging users, the placement of the banner is the dominant factor in determining attention capture and retention. These findings highlight the importance of strategic ad placement in digital advertising and suggest that, when the goal is to maximize visual attention –or when operating under budget constraints– optimizing banner placement should be given priority over creative adjustments. Moreover, these results contribute to a deeper theoretical understanding of how image content and banner location interact, modulating visual attention. This interaction supports emerging models of attention allocation in digital contexts, which posit that both stimulus-driven and goal-driven mechanisms dynamically influence online advertising effectiveness (Duchowski, 2017; Hamborg et al., 2012; Wedel and Pieters, 2008).

Furthermore, the interaction between banner position and image type provides additional insights into how these factors work together to influence visual behavior. Analyses of variance and dependency modeling show that, in the banners that are initially visible when the user opens the website (top horizontal and right rail), images with smiling faces capture and retain more attention than functional banners typically used in hotel advertising. In this sense, the literature in psychology has shown evidence that the mere presence of people in an image affects the viewer's gaze, entails a stronger ability to process a scene (Humphrey and Underwood, 2010) and, consequently, leads to more effective advertising banners in the digital environment (Sajjacholapunt and Ball, 2014). More specifically, the viewer is attracted to the presence of faces due to their social, emotional (Palermo and Rhodes, 2007; Langton et al., 2006) and/or biological significance (Ro et al., 2001). In addition, it has been found that smiles, compared to other expressive features, have a greater ability to attract the observer's attention (Calvo and Nummenmaa, 2016).

On the contrary, when the user continues actively browsing, scrolling, and discovering the middle and bottom part of the web environment, users are more attracted to banners with images that convey feelings or experiences. Although the possible strong sense of positive emotion (e.g., Calvo et al., 2015) or the greater presence of people (Humphrey and Underwood, 2010) in experience-based images and those with happy faces, would justify their greater ability to capture and retain the observer's attention with regard to banners with more

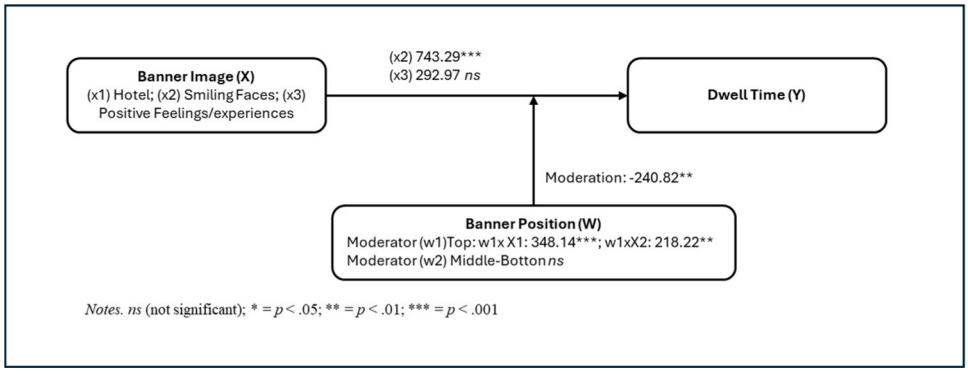

Fig. 1. Moderation model for effect of position and image on the dwell time (Model 1).

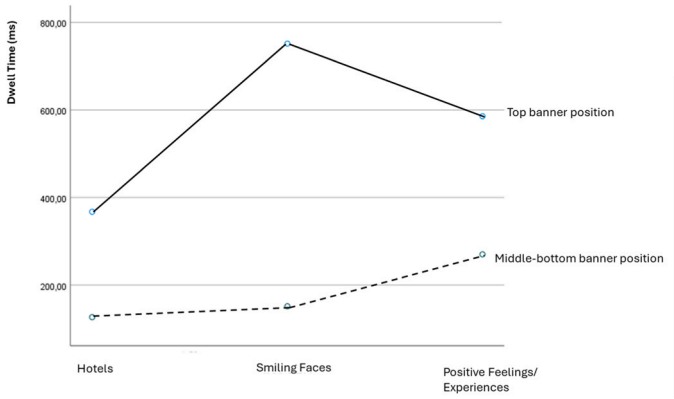

Fig. 2. Conditional effect of position and image on the dwell time.

functional images, it does not explain why one type of image achieves better results in higher positions and other types of images in middle and bottom positions.

It has been shown that the way in which we browse the internet can influence the pattern of visual exploration (Hamborg et al., 2012). Some studies argue that when the task consists, as in this study, of freely browsing news websites, the observer's attention is guided by bottom-up processing (Duff and Faber, 2011). In these circumstances, variables related to the distractor stimulus are more likely to influence the individual's visual behavior (Abedi and Koslow, 2022). This would account for the fact that banners with happy faces located in higher positions have a greater influence on the observer's visual behavior. In the first moments after opening the website, the user is more susceptible to fast and automatic visual (bottom-up) processing. Some studies claim that, due to their social and emotional significance, faces have the ability to attract visual attention automatically and faster than any other "non-social" stimulus (Palermo and Rhodes, 2007; Langton et al., 2006), especially if they include smiles (Calvo et al., 2017; Fernández-Martín et al., 2017).

However, other authors state that the viewer's visual behavior is guided by the type of web content rather than by the user's goal. In this regard, Sapronov and Gorbunova (2022) argue that, when browsing a news website (as in this study) users encounter mostly textual information and that processing this type of information requires cognitive processes involving top-down attention. This could explain why when the user begins to actively browse the rest of the website, his or her attention-based selection process is more attracted to experience-based stimuli. It stands to reason that the participants, regular guests at four and five star hotels, are more interested in stimuli that convey experiences or feelings related to the use of hotel accommodation services.

It is possible that initially, when the website is opened, attention is guided by bottom-up processing so that smiling faces have more influence on the viewer's visual behavior. However, when the user begins to actively explore the rest of the website (middle or bottom part), the attentional process changes, moving to a more controlled processing approach (top-down), leading the user to more consciously evaluate what they find relevant or interesting. This change in attentional processing explains why the effectiveness of the image type depends on the banner's position on the website. These are the variables to consider if we want to maximize attention at different stages of the browsing process.

From a theoretical perspective, the proposal of two distinct phases—an initial automatic attention phase (bottom-up) and a later goal-directed phase (top-down)—offers a novel insight into the temporal course of visual behavior during internet browsing. This attentional shift over time determines how effectively ads capture and hold attention, depending on their content, timing, and placement. This interpretation aligns with the dual-network model proposed by Corbetta and Shulman (2002), which differentiates between a ventral attention system—specialized in the detection of salient and unexpected stimuli, operating in a stimulus-driven, bottom-up manner—and a dorsal attention system, which guides voluntary, goal-directed attention based on internal goals and expectations. According to this framework, images of smiling faces in prominent positions are more likely to activate the ventral system early in the session, while experience-based images become more effective when users engage the dorsal system in later stages of browsing, as they search more deliberately for personally relevant content. This interpretation is supported by previous findings showing that smiling faces are particularly salient visual stimuli that automatically attract attention due to their high emotional and social significance (Calvo and Nummenmaa, 2016; Calvo et al., 2017). This theoretical perspective reinforces the contribution of our findings to the literature on online visual attention by showing how banner design and placement interact with attentional mechanisms that unfold dynamically during user navigation.

From a theoretical standpoint, the findings of this study contribute to refining traditional hierarchical models of advertising effectiveness, such as the AIDA framework (Lavidge and Steiner, 1961), which emphasize attention as the critical first step in the consumer decision-making process. While prior research in hospitality has often assumed attention as a prerequisite for subsequent cognitive and behavioral responses, our results offer a more granular understanding of how attention operates during web browsing. By demonstrating that the effectiveness of different image types is moderated by banner position—and by grounding these effects in dual-system models of attention (Corbetta and Shulman, 2002)—we extend the classic model by introducing a dynamic, neurocognitively-informed perspective on the attention phase. Specifically, our findings suggest that the ability of hotel advertising to capture attention is not only a matter of content relevance but also of strategic positioning and timing, which activate different attentional systems at different stages of browsing. This

enriched view of the 'Attention' stage enhances both the theoretical robustness and practical applicability of the AIDA framework in the digital hospitality context.

In any case, regardless of the placement, creative materials with images of happy faces, or those that convey feelings or experiences obtain better results than those focusing on hotel products. These results do not mean that hotels should not strive to show an attractive image of the hotel (describing its services and features) in their marketing materials, as this is vital to achieving a purchase in a highly competitive environment such as hotel bookings (Lin, 2016), where offering tangible elements of the service allows the associated with the purchase to be reduced (Baek and Ok, 2017). By this, we mean that in order to capture attention in generic media where companies invest in advertising, there must be a paradigm shift. In other words, we must move from tangibilizing the service by showing the services or facilities offered by the hotel establishment, to tangibilizing the experience, showing what the potential customer could enjoy, experience or feel. Hedonic creative materials (based on emotional or experience-based benefits) capture and retain more attention and are perceived as more appealing, increasing the likelihood that the individual will access the booking or hotel website and learn about the offer, thereby initiating the desired conversion funnel.

The results of this study also help to combat banner blindness. Without visual attention, it is unlikely that recognition and recall will occur, attitudes towards the brand will be forged, or that the ad will be clicked on (Drèze and Hussherr, 2003). The fact that website users do not pay attention to banner ads (Muñoz-Leiva et al., 2019) or even avoid looking at them (Nielsen, 2007) is a major problem for advertisers. Even more so if we take into account the increasing use of ad blockers (Despotakis et al., 2021) and mobile devices (Boerman et al., 2017). Having guidelines on how image types and banner position on a website can help to capture and retain the attention of observers, allowing for the implementation of much more effective retargeting campaigns.

Limitations of the study

The findings of this study are important to help effectively manage advertising budgets. However, the research is not without its limitations. Firstly, it is important to acknowledge the constraints inherent to the experimental methodology. Although allowing participants to browse freely enhances ecological validity, the study was conducted in a highly controlled laboratory environment, which likely does not fully reflect the complexity of real-world web navigation. Additional distractions, multitasking, or personalisation algorithms may influence users' visual attention during browsing, potentially limiting the generalizability of these findings to more dynamic and personalized online environments.

The study deliberately excluded algorithmic personalization to preserve experimental control over banner content and visual stimuli. While this approach enhanced internal validity by ensuring consistency across participants, it also limited the applicability of the findings to real-world settings where personalization significantly influences user responses (e.g., Ameen et al., 2021; Bleier and Eisenbeiss, 2015). Future research should explore how the interplay between banner image, placement, and algorithmic personalization affects user engagement, particularly in highly competitive service contexts such as hospitality.

Moreover, the study focused exclusively on visual attention as a measure of advertising effectiveness. While attention is a necessary prerequisite for further cognitive or behavioral processing, it is not sufficient to fully capture advertising impact. No attitudinal or behavioral outcomes—such as recall, brand evaluation, emotional response, or booking intention—were included in the analysis. These aspects are essential for evaluating the broader effectiveness of online advertising and should be addressed in future research.

It is worth noting that, although the image design produced statistically significant effects on visual attention, these were modest compared to the substantially larger impact of banner placement, as evidenced by notably higher effect sizes. From a practical standpoint, this suggests that in campaigns with limited resources, prioritizing strategic banner placement may yield greater visual engagement than focusing solely on creative image adjustments. This insight underscores the importance of directing budget allocation toward factors that demonstrably influence attention more strongly.

Despite these limitations, the study makes a significant contribution to a better understanding of how banner position and image influence users' visual attention. Future research could enhance external validity by tracking real user interactions on actual websites. Additionally, incorporating post-exposure surveys or behavioral simulations could provide insight into whether the attention captured translates into meaningful consumer responses.

CRediT authorship contribution statement

Ricardo Díaz-Armas: Writing – review & editing, Funding acquisition. **Desiderio Gutiérrez-Taño:** Writing – review & editing, Software. **Sara Campo:** Writing – review & editing, Methodology, Formal analysis. **Andrés Fernández-Martín:** Writing – original draft, Methodology, Funding acquisition, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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