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Visual Factors Influencing Booking Intention on Online Travel Agent Platforms

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Abstract

This study examines the influence of visual design elements on user attitudes and booking intentions within online travel agent (OTA) websites. Grounded in the Stimulus–Organism–Response (S-O-R) framework, it investigates how color (red and green text) and imagery (human-centric versus scenery-centric) as visual stimuli shape users' attitudes (organism) and subsequent behavioral intentions (response). A total of 30 samples, were collected using Tobii Pro Spectrum and Tobii Pro Lab, combining gaze-tracking indicators with self-reported survey responses to capture both behavioral and perceptual dimensions of user experience. The results reveal that human-centric imagery significantly enhances user attitudes, which in turn positively influence booking intentions, demonstrating the persuasive impact of relatable human visuals in digital environments. In contrast, green text and scenery-centric imagery show no significant effect on attitudes, suggesting that color and landscape imagery may be less effective in stimulating positive user responses. Theoretically, the findings contribute to understanding visual persuasion mechanisms in online service contexts, while practically, they offer insights for marketers and UX designers seeking to improve website engagement and conversion through strategic visual design. Limitations include a homogeneous participant sample and a narrow focus on selected design cues, indicating directions for future research to examine diverse user groups, additional interface elements, and long-term behavioral effects.

Keywords: visual design; online travel agent; booking intention; website, S-O-R model

1. Introduction

As digital technology has developed rapidly, it has transformed the ways in which consumers interact with online travel agencies (Xiang et al., 2015). The online travel market is predicted to earn as much as 692.78 billion USD (Statista, 2024). A variety of elements shapes user experience, but visual design has become an increasingly important factor (Jongmans et al., 2022). From website layout to color, imagery, and call-to-action buttons, an OTA's visual elements are essential to capturing attention and driving bookings (Amer, 2021). The importance of visual aesthetics in digital marketing has increased, but there is a need to understand how specific design elements influence consumer engagement and decision-making.

The concept of visual cues has been demonstrated through theoretical perspectives such as user experience (UX) design and consumer behavior to not only attract attention but also shape perceptions of trustworthiness, professionalism, and emotional attachment (Karimov et al., 2011). Users can make decisions using colors, such as red for urgency and green for relaxation, while carefully selected imagery can help them visualize their travel experiences (Cochrane et al., 2019a, 2019b).

The purpose of this study is to examine how design elements, specifically visual cues, influence booking behavior on OTA websites. The study investigates how visuals influence consumer perceptions and actions. The eye-tracking technology will also be used to provide objective insights into consumer attention and engagement with various design elements followed by self-report survey. In addition to providing practical insights into the effectiveness of visual design, the research also suggests ways to improve OTA website strategies. Considering that online platforms form the primary channel for travel bookings and planning, it is crucial that businesses understand the visual dynamics of consumer behavior. As this study explores the influence of visual design on decision-making in the online travel industry, it contributes to the rapidly growing field of digital marketing and consumer behavior.

2. Literature Review

2.1. *Online Travel Agency (OTA) Website*

Authors The online travel agencies (OTAs) have transformed the way consumers plan and book their travel experiences (Mayr & Zins, 2009). It keeps growing and play a role as much as 2/3 of the whole travel industry (Statista, 2024). OTAs have become a crucial part of the global travel industry by providing a centralized platform for browsing, comparing, and purchasing products and services related to travel (Zheng & Guo, 2016). A major advantage of online travel agencies is that they offer a convenient self-service booking method that allows users to explore options and make decisions at their own pace (Kourtesopoulou et al., 2019). As a result of this customer-centric approach, OTA websites have grown rapidly in popularity, becoming the preferred choice for many modern travelers.

In addition to booking flights, hotels, car rentals, and vacation packages, OTA websites also integrate several other services (Statista, 2024b). With these websites, detailed information, customer reviews, and price comparisons are presented visually to streamline the decision-making process (Sun et al., 2016). Since OTAs are competing, user experience (UX) has continually evolved, emphasizing ease of use, transparency, and engagement (Setiawan & Widanta, 2021).

In OTA website design, visual elements play a critical role in attracting and keeping users' attention (Fahlevi, 2021). To assist users in browsing and booking, websites frequently utilize high-quality images of destinations, promotional banners, and call-to-action buttons strategically placed. Furthermore, OTA websites' aesthetic appeal and functional layout have a significant influence on consumers' trust and willingness to book (Baek & Michael Ok, 2017). It has been shown that visually appealing designs that convey professionalism and reliability are more likely to convert casual browsers into loyal customers (Din et al., 2016).

Aside from their advantages, OTA websites face challenges such as intense market competition, information overload, and maintaining consumer trust online (Sharma et al., 2020). In order to meet consumer expectations, OTAs must optimize their visual and

functional design. With advanced technologies such as eye-tracking, OTA platforms can improve their offerings and remain competitive in the travel industry by understanding user behavior.

2.2. *Website visual influence*

2.1.1. Color Centric

The theoretical framework surrounding color in website design emphasizes its role as a psychological and emotional stimulus influencing users' perceptions, attitudes, and behavior (Bhandari et al., 2019). There are specific colors that play distinctive and strategic roles in Online Travel Agency (OTA) websites, such as red and green.

In color psychology, red is associated with urgency and arousal (Kaushik & Srinivasa, 2017). According to the arousal theory, red stimulates excitement and immediate action, making it a great choice for "Book Now" buttons and promotional banners. The ability of red to attract attention aligns with previous study, which emphasizes that prominently situated, vibrant colors draw attention, causing quick decisions to be made. Red is most effective when aligned with high-discount promotional campaigns and limited-time offers, according to previous study (Ye et al., 2020). Red used inappropriately, such as with low-cost deals, can reduce processing fluency and adversely affect consumer perception (Young et al., 2013).

Affective processing theory explains how colors invoke emotional responses, while green is associated with calmness, trust, and relaxation (Bollenbach et al., 2022). A green color is often associated with relaxation and harmony in wellness or leisure situations. Consumers are emotionally attracted to it because it is associated with nature and balance (Hartmann & Apaolaza-Ibáñez, 2008).

2.1.2. Image Centric

It is important to understand that imagery has the power to convey information and evoke emotional responses, and it can be categorized into human-focused visuals and product-focused visuals (Arunkumar et al., 2023). Images serve different purposes and align with different theoretical frameworks in consumer behavior. Human-focused imagery is based

upon the social identity theory, which suggests that consumers are more likely to form emotional connections when they see relatable people in advertising (Laskey et al., 1994). User experience is more aspirational and relatable when people are shown enjoying destinations or services. Similarly, pictures of families enjoying beach vacations align with consumers' personal goals and desires. Additionally, viewing images of others in positive situations triggers the mirror neuron theory, which leads to an increase in engagement and bookings when viewers observe others in positive situations (Mohan et al., 2013).

In contrast, product-focused imagery emphasizes the tangible benefits of a product or service based on utilitarian visual theory (Sinha & Verma, 2020). Image of travel destinations provide factual, sensory information to users, which facilitates their rational and informed decision-making. Previous study mentioned that product-centric image received longer and higher fixation score compare to other pictures (Zhou & Xue, 2021). Therefore, red and green colors are used in combinations with human-focused and product-focussed imagery to emphasize the duality of emotional and cognitive processes involved in consumer decision-making. The visual elements of OTA websites can be aligned with established theoretical frameworks in order to optimize engagement and trust with users, as well as drive booking behavior by fostering that trust.

2.3. Online Booking Behavior

Consumers search, evaluate, and reserve travel through digital platforms such as online travel agency (OTA) websites that effects online booking behavior (Bogdanovych et al., 2006). As consumers increasingly use digital tools for travel planning, understanding the factors influencing consumer behavior has become an increasingly important area of study in e-commerce and tourism research. As OTAs provide users with convenient ways to compare travel options (Kim et al., 2009), they have become one of the most dominant forces in the travel industry. Consumers' decision-making processes on these platforms are influenced by a complex interplay of trust, website usability, price sensitivity, and information availability.

A key factor in online booking behavior is trust, as consumers often perceive online transactions as risky (Amin et al., 2021). Concerns about data privacy, payment security, and service reliability can deter users from completing bookings (Lang, 2000). As part of their efforts to establish credibility and foster user confidence, OTA websites often incorporate security badges, clear refund policies, and detailed customer feedback (Talwar et al., 2020).

It is also important to consider the visual design of an OTA's website when determining booking behavior (Tam et al., 2024). According to the Elaboration Likelihood Model (ELM), visual cues, such as appealing color schemes, high-quality destination imagery, and strategically placed call-to-action buttons, influence user engagement during decision-making (Lam et al., 2022). Creating aesthetically pleasing designs enhances the user experience and reinforces the platform's professionalism. In addition to these design factors, cognitive factors help users navigate the booking journey, making the experience intuitive and emotionally engaging (Perrig et al., 2023).

The Stimulus-Organism-Response Framework (S-O-R) (Mehrabian & Russell, 1974) describes the interaction between color and imagery to influence users' emotional and cognitive states (the organism), and eventually their behavioral responses, such as making a booking. In addition, dual-process theories suggest that while colors may trigger fast, emotional decisions (peripheral processing), imagery supports detailed, rational evaluation (central processing).

2.3. Eye-tracking in hospitality

In the hospitality industry, eye-tracking technology offers valuable insights into consumer behavior, particularly on Online Travel Agency (OTA) websites (Scott et al., 2019). Using eye-tracking, stakeholders can learn how users interact with elements on a website such as navigation menus, CTA buttons, color schemes, and imagery by capturing and analyzing their visual attention patterns. User data reveals where and how users pay attention to certain elements, how long they spend engaging with them, and how they navigate visually (Lu & Pesarakli, 2023). These insights are crucial for optimizing

website design, making sure that key information is noticed, and effectively leading users toward booking.

Studies using eye-tracking techniques are instrumental to understanding information-processing behaviors on OTA websites. It is helpful to designers to understand how users follow common visual patterns, such as the F-pattern or Z-pattern of reading (Pollatsek et al., 2006) or top-down factors (Lee & Ahn, 2012) to strategically place critical elements like pricing, customer reviews, and booking options. As a result of aligning content placement with natural visual behavior, users will have a more seamless experience, improving usability and engagement (Chi, 2002). Furthermore, through fixation result, eye-tracking reveals which parts of a homepage influence decision-making most effectively, such as promotional banners and destination images (Yang et al., 2022).

Eye-tracking research goes hand in hand with frameworks like the Stimulus-Organism-Response (S-O-R) Framework, which explains how visual stimuli affect users' emotions and cognitive functions. Eye-tracking data will also show how important it is to have clarity in visual perception and ease of navigation (Cuddihy & Spyridakis, 2012). As a result of these theoretical insights, it can be concluded that visual design plays a significant role in influencing consumer satisfaction and influencing OTA platform decision-making.

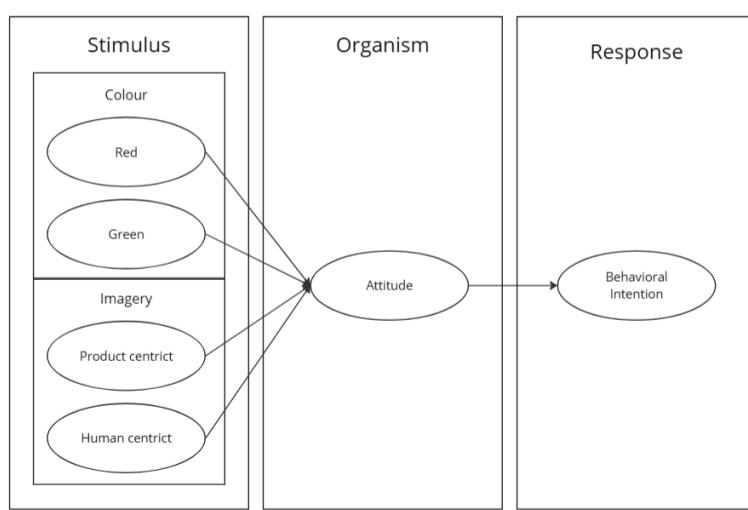


Figure 1. Research Method

3. Methodology

This study adopts a mixed-method experimental design that combines eye-tracking and survey-based data collection to understand how visual design factors influence users' booking intentions on Online Travel Agent (OTA) websites. A within-subjects experimental design was employed, and the presentation order of stimuli was counterbalanced to minimize order effects. Firstly, to capture visual attention metrics, eye-tracking technology was employed, namely Tobii Pro Spectrum and Tobii Pro Lab. In recent years, Tobii Pro Lab, a software package that aids in the design of experiments and the interpretation of results, has been widely adopted in research (Gómez-Carmona et al., 2021).

A total of 30 participants in their 20s were recruited through convenience sampling. Each participant was seated approximately 60 cm from the screen in a controlled lab environment to minimize distraction. The experiment was conducted in a dimly lit, sound-controlled room to prevent glare and distractions. A standard 9-point calibration was performed before each session using Tobii Pro Lab to ensure tracking accuracy. They were asked to browse the OTA website stimuli naturally while their gaze behavior was recorded using Tobii Pro Spectrum at 120 Hz. Each stimulus was displayed for 8 seconds, followed by a 2-second blank screen to separate trials and reset visual attention. Before the experiment began, a consent form was obtained from each participant to ensure that all participants were fully informed about the study's purpose and procedures and voluntarily agreed to participate.

The experiment lasted approximately 7 minutes per participant. Various website focuses, such as fixation points and Areas of Interest (AOIs), were presented to participants to measure visual engagement. There were several strategic AOIs determined for the analysis of the website, including promotion-based or emotional-based AOIs or even different imagery, such as a scenic or human-based image. In addition to allowing the evaluation of key metrics such as fixation counts, gaze duration, and viewing sequences, these regions provided detailed insights into visual attention and behavior (Winter et al., 2023). As well as collecting eye-tracking data, this study administered a questionnaire to collect participants' subjective evaluations and preferences.

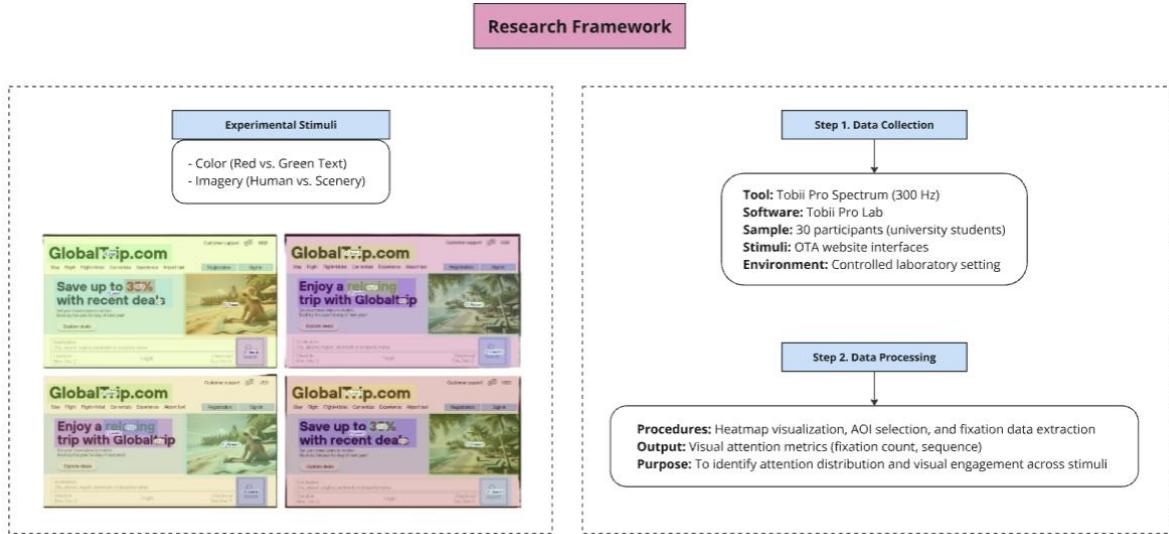


Figure 1. Research Framework

4. Results

In this section, the findings are from the research framework will be presented, including eye-tracking data. By analyzing eye-tracking data using Tobii Pro Spectrum and Tobii Pro Lab tools, participants' visual attention patterns were visualized via heatmaps and fixation metrics within predefined areas of interest (AOI). In addition, data collected through an online platform was categorized and coded for quantitative analysis.

4.1. Fixation Duration Result

The first part being the visualization of the Area of Interest (AOI) in this study. There are 9 AOI which are “Infos”, “Logo”, “Category”, “Button 1”, “Button 2”, “Word”, “Pic”, “Bar”, and “Search”.

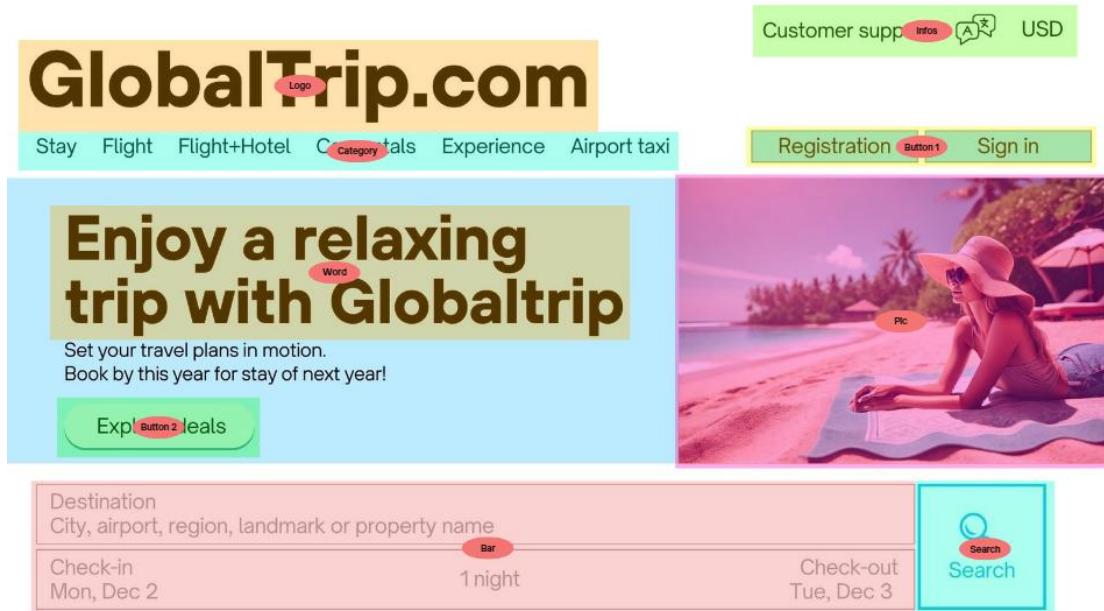


Figure 2. Visualization of Area of Interest

Significant differences in fixation durations were observed across the Areas of Interest (AOIs). The "Pic" area received the highest average fixation duration ($M = 797.69$, $SD = 1042.88$), indicating participants spent the longest time focusing on the image content, likely because of its attractiveness and prominent placement (Lang et al., 2015). The "Bar" AOI had a mean fixation duration of 242.52 ($SD = 444.62$), suggesting its importance as an interactive element for entering trip details. As a result of substantial attention by users, the "Category" section received a mean fixation duration of 205.21 ($SD = 547.90$), indicating its relevance in guiding them to explore different options.

The "Search" button, on the other hand, showed the shortest average fixation duration ($M = 50.62$, $SD = 137.70$), indicating limited engagement, perhaps because of its smaller size or less prominent location. In addition, the "Info" ($M = 77.59$, $SD = 206.89$) and "Logo" ($M = 96.00$, $SD = 218.37$) areas experienced relatively short fixation times, suggesting that these elements were not as important to the immediate task. There were moderate fixation durations for "Button 1" and "Button 2" ($M = 158.62$ and $SD = 286.43$), suggesting their functionality attracted moderate attention, but not as prominently as other AOIs.

According to these findings, participants' visual engagement was significantly influenced by visual hierarchy, size, and task relevance. There are several areas that were prioritized, including "Pic" and "Bar", while some elements, including the "Search" button, may require design improvements to enhance visibility and usability.

Table 1. Mean differences of AOI

Area Of Interest (AOI)	Mean	Std. Deviation
Pic	797.69	1042.88
Bar	242.52	444.62
Category	205.21	547.90
Button 1	158.62	286.43
Button 2	148.24	300.519
Logo	96.00	218.37
Infos	77.59	206.89
Search	50.62	137.70

4.2. Heatmap analysis

A heatmap analysis provided valuable insights into how participants focused their attention across the interface. An area represented in red indicates a higher level of attention, whereas an area represented in green indicates a lesser level of attention. The picture area generally captured the most attention, as shown by the vibrant red coloration, highlighting its strong visual appeal and central position on the webpage. Considering the fixation duration data, this confirms the importance of the image for attracting users' attention.

Additionally, the "Explore Deals" button received considerable attention, as indicated by yellow to light red areas surrounding it. However, the "Search" button and "Infos" section showed minimal attention due to their predominantly green coloration, suggesting that they are less visually appealing and may require design improvements.

It is interesting to note that the "Category" section at the top of the webpage received moderate attention, showing a mix of green and yellow areas. Although participants noticed it, it did not receive as much attention as other elements like the pictures or the button. Despite primarily being green, the logo and navigation bar also received some attention, suggesting that users may perceive these elements as secondary.

Ultimately, the result of the heatmap shows that it is in line with the mean differences results. The heatmap results emphasize that visual hierarchy is essential when designing a website. In this study, elements that featured vivid imagery or prominent placement, like the picture and buttons were most effective at capturing attention. Functional elements such as the "Search" button and the "Infos" section may benefit from changes to improve their visual appeal.



Figure 3. Heatmap Visualization of Human vs Scenery



Figure 4. Heatmap Visualization of Red vs Green

5. Conclusion

In this study, the use of visual design elements, such as red and green colors, as well as imagery (Human-centric and Scenery-centric), were examined to determine the influence of visual design elements on attitudes and behavioral intentions. User attitudes and behavioral intentions are positively impacted by human-centric images. In contrast, other visual elements, such as green-colored text and imagery centered around scenery, had no effect on attitudes or had a negative effect. The findings emphasize the importance of using engaging and relatable visual elements in digital interfaces to foster positive perceptions and encourage user behavior.

5.1. Theoretical Implications

The findings of this study contribute to the Stimulus-Organisation-Response model by highlighting how human-centric imagery influences user attitudes that facilitate behavioral intentions (Wang et al., 2014). As a result of this study, theoretical understanding is advanced by demonstrating that not all visual stimuli have the same impact on attitude formation. The study emphasizes the importance of human-centered

stimuli in enhancing user engagement and explains how attitudes mediate the relationship between visual design elements and behavioral intentions (Vardouli, 2015). It contributes to the existing research on user interactions with online visual elements by doing so. elements in digital interfaces to foster positive perceptions and encourage user behavior.

5.2. Managerial Implications

Marketers and users experience professionals (UX professionals) can benefit from the findings. Marketers and users experience professionals (UX professionals) can benefit from the findings. For OTA managers, these insights provide evidence-based direction for designing visually persuasive booking interfaces. The first thing to prioritize in digital platforms is human-centric imagery, which significantly improves user attitudes and drives behavioral intention (Houser & Esposito, 2021). This suggests that integrating people-oriented visuals such as travelers or hosts can evoke stronger emotional engagement and trust in OTA contexts.

A second recommendation is to critically evaluate the use of other visual elements, such as green-colored text and scenic images, which may have limited effects on user engagement. As a third point, organizations should optimize their call-to-action designs to make sure they align with their users' preferences and increase positive attitudes (Jung et al., 2020). In addition to enhancing user experience and conversion rates, companies can also foster stronger user engagement with their platforms by applying these insights. In addition to enhancing user experience and conversion rates, companies can also foster stronger user engagement with their platforms by applying these insights. Overall, the results provide actionable guidelines for OTA managers, marketers, and UX teams to strategically apply visual design elements that improve user engagement and booking intention.

5.3. Limitations

There are a few limitations to this study, despite the fact that it provides valuable insights. Firstly, the relatively small and homogenous sample size, primarily composed of

participants in their 20s, limits the generalizability of the findings to a broader demographic group. Second, the study's focus on a single platform and specific visual design elements may not capture the effects in other contexts or industries. In addition, only a limited number of variables were evaluated, including only colors and imagery and excluding other potentially important factors, such as layout and text size. Lastly, behavioral intentions were measured through self-reports, which may not always reflect actual behavior, potentially introducing bias.

The findings of this study should be replicated by larger and more diverse study populations, ensuring greater generalizability across demographics and cultures. The effects of typography, animations, and layout on user behavior should also be explored in future research, in order to gain a more comprehensive understanding of their effects. It would also be possible to conduct longitudinal studies to determine if these design elements affect actual behavior rather than immediate behavioral intentions in the long run. To analyze relationships between variables that are more complex, advanced analytical methods may be applied, such as structural equation modeling (SEM) or machine learning. Additionally, cross-industry or cross-platform comparisons can be conducted to determine the consistency of visual design effects.

Supplementary Materials: The data supporting the findings of this study are available from the author upon request.

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