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Text Overlays Versus Scenic Background in Tourism Advertising: An Eye-Tracking Neuromarketing Analysis

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Abstract

The study examines how centrally placed textual overlays in tourism video advertising influence perception of scenic spots, focusing on how captions redirect visual attention away from background scenery that should convey destination image and emotional appeal. Eye-tracking data from 20 university students were collected while they viewed a 30-second tourism video with centrally positioned captions. Areas of interest were defined for text and scenic background, and dwell time, time to first fixation, mean fixation duration and saccade parameters were compared between text and scenery using paired inferential analyses. Text areas of interest attracted substantially longer dwell times and earlier fixations than scenic background, with cumulative differences exceeding 10 seconds of viewing time. Mean fixation duration did not differ between areas, indicating that text dominance reflects attentional allocation rather than processing depth, while saccade measures showed only small effects consistent with stable oculomotor control. The findings provide initial support for a text-overshadowing interpretation by suggesting that centrally placed captions can dominate visual attention and reduce engagement with scenic imagery under the tested conditions. The study contributes to theory by distinguishing between attentional allocation and fixation processing and offers practical guidance by recommending delayed or repositioned captions to preserve the emotional and experiential value of scenic destination imagery.

Keywords: Management, scenic spot, marketing, students, iMotions

1. Introduction

Neuromarketing is a discipline that applies concepts from neuropsychology to marketing research (Avinash et al., 2018), with the aim of studying and predicting human behavior as influenced by marketing practices. Historically, this field has attracted strong interest from companies because it provides tools for improving advertising campaigns, optimizing product

communication, and ultimately increasing profits (Mashrur et al., 2022; Quiles Pérez et al., 2024).

In recent years, neuromarketing has developed into a genuinely interdisciplinary area, integrating neuroscience, psychology, and marketing to uncover the neural foundations of consumer behavior (Babiloni & Cherubino, 2022). These studies extend to key processes such as decision-making, emotions, attention, and memory in response to marketing stimuli including brands, packaging, and advertisements (Dongye & Ziyuan, 2024; Ouzir et al., 2024).

The literature on neuromarketing has expanded considerably, reflecting its growing role in both academia and practice. Reviews highlight that despite the diversity of findings, there is still a lack of systematic classification of research themes and a need for stronger synthesis of what is known and unknown from a business and management perspective (Bhardwaj et al., 2023). Particularly in tourism marketing, prior research has emphasized the emotional power of scenic imagery to generate feelings of awe, immersion, and positive effect. However, less is known about how design elements can interfere with or even suppress this effect.

The present study addresses this gap by examining whether centrally placed text in scenic tourism advertising disrupts the intended emotional engagement with background imagery. To answer this question, we apply neuromarketing tools such as eye-tracking to uncover hidden barriers to visual engagement and to empirically test theoretical claims about the subconscious processing of marketing stimuli in consumer behavior.

More specifically, we focus on tourism video advertising in which large textual slogans and calls-to-action are superimposed over scenic imagery of the destination. While prior eye-tracking studies in advertising have explored attention to text, pictorial elements and brand logos, they have rarely examined whether such central text overlays in tourism ads suppress attention to the scenic background that should build destination image and emotional appeal.

Accordingly, the study is guided by the following research questions:

RQ1: Do centrally placed text overlays in a tourism video ad attract more visual attention (higher cumulative dwell time and earlier first fixations) than the scenic background?

RQ2: Is this dominance of text accompanied by systematic differences in fixation microstructure and saccade dynamics, or does it primarily reflect how often the gaze returns to the text region?

RQ3: Do viewers exhibit anticipatory fixations toward the text location even in frames where no text is present, indicating a combination of central fixation bias and learned expectations about where key information appears on screen?

To clarify the conceptual logic of the study without introducing a separate graphical model, we frame central caption placement as an attentional design factor that may influence downstream tourism communication outcomes. Centrally positioned text overlays are expected to benefit from visual salience, readability and central fixation bias. As a result, they may attract earlier fixations, repeated gaze returns and longer cumulative dwell time. Because visual attention is limited, this attentional advantage of captions may reduce visual engagement with the scenic background, which is important for destination image formation, emotional response, recall and visit intention. The present study empirically focuses on the first part of this conceptual chain, namely the relationship between central caption placement and visual attention. The possible downstream effects on emotion, memory and behavioural intention are discussed as implications and directions for future research.

2. Literature Review and Theoretical Background

Neuromarketing can significantly contribute to tourism research by capturing objective, subconscious, and spontaneous emotional responses in real-time, which is difficult to achieve through traditional self-report methods such as surveys and interviews (Li et al., 2023). In tourism marketing, advertising is also used to reach more consumers and travelers (McKercher & Koh, 2017), as human cognition can be influenced by subliminal stimuli that activate existing knowledge or beliefs (Hsu & Chen, 2020; Smarandescu & Shimp, 2015). Potential travelers must anticipate their vacation experiences when selecting a destination. Advertisements are used as external stimuli to support this visioning process by eliciting emotions and conveying specific experiential dimensions. Findings suggest that the impact of advertisements in sparking travelers' interest and fulfilling their informational needs depends on the type of anticipated travel experience. Emotional responses to advertisements partially mediate their effectiveness (Tercia et al., 2020).

With the growing integration of the internet into the tourism industry, travel websites, search engines, social media, and short video platforms have gradually become the primary channels for sharing, transmitting, and obtaining information (Önder et al., 2020). Public information searches on major search platforms reflect the attention and interest of potential tourists in scenic locations, but there are few studies on how attention, interest, and information seeking influence potential tourists in developing actual purchasing behavior (Zhao et al., 2024). User-generated images of scenic locations are important and effective means of shaping destination images for prospective visitors (Deng & Li, 2018). From the public's perspective, natural attractions rely on beautiful landscapes, such as peaceful natural environments and untouched wilderness, to draw tourists. Natural scenery (e.g., lakes, rivers, mountains, seas, storms) are often perceived as sacred (Vespestad & Lindberg, 2011). Being in nature provides a unique aesthetic experience and is more likely to evoke a sense of awe (Zhang & Xu, 2020).

The relevance of scenic elements in tourism advertising can be explained through destination image theory. Destination image is usually understood as a combination of concrete attributes of a place and more holistic impressions connected with atmosphere, emotions and expected experience (Echtner & Ritchie, 1993). In this sense, landscapes, natural scenery and visual symbols of a destination are not only aesthetic additions to an advertisement. They are part of the information from which potential tourists form an impression of what the destination may offer.

Destination image is shaped by both external stimuli and individual characteristics of tourists (Baloglu & McCleary, 1999). Promotional videos, photographs and social media content therefore act as important stimuli before the actual visit takes place. In digital tourism communication, the first contact with a destination is often visual. Viewers may first encounter a place through short videos, online photographs or advertising clips, and only later search for more detailed information. This gives the scenic part of a tourism advertisement an important role in forming expectations, emotions and initial preferences.

Previous research also shows that destination image is linked to evaluation, preference and behavioural intention (Tasci & Gartner, 2007). For this reason, the visual background in a tourism video should not be understood as a passive backdrop. It carries information about atmosphere, attractiveness and possible experience. If viewers spend most of their time looking at centrally placed text, they may process less of the scenic information that contributes to the formation of the destination image. This creates a tension between the informational role of captions and the experiential role of destination visuals.

In neuromarketing, a scenic spot refers to an advertisement or marketing content that leverages visually appealing and emotionally engaging scenery to capture the audience's attention and evoke positive emotional responses. These scenic spots utilize elements such as breathtaking landscapes, captivating architecture, or picturesque environments (Deng & Li, 2018) to create an immersive experience for the viewer. The goal of a scenic spot in neuromarketing is to tap into the audience's subconscious and elicit emotional reactions that can influence their perception of the promoted brand or product. By presenting a product or brand against a visually stunning or emotionally resonant backdrop, marketers aim to create positive associations and enhance brand recognition and recall.

Neuromarketing research suggests that scenic spots can stimulate brain regions associated with emotions, memory, and attention, leading to increased engagement and receptiveness to the marketing message. In the context of neuromarketing, the scenic spot becomes a tool designed to appeal to the unconscious processes in customers' brains, influencing their decision-making and behavior. Neuromarketing explores how the human brain responds to various stimuli and how these responses can be harnessed to improve marketing strategies (Wearing & McGehee, 2013). Overall, scenic spots in neuromarketing represent a strategic advertising approach that uses the power of visual storytelling and emotional appeal to effectively communicate brand values and influence consumer behavior.

The use of neuromarketing tools in promotional activities opens the door to a deeper understanding of travelers' reactions and preferences. Eye-tracking, which monitors travelers' eye movements while viewing advertisements, provides valuable insights into what captures their attention the most. This method is effective for optimizing ad visuals and target websites to attract maximum attention (Holmqvist & Andersson, 2017). Overall, these neuromarketing techniques are a valuable asset for travel agencies, helping them better understand travelers' psychology and effectively tailor their promotions to meet their needs and desires. As neuromarketing tools are increasingly used to promote travel, it is important to consider the impact of social media. Neuromarketing tools can be effectively employed to track travelers' emotional reactions and interactions with content on social media platforms. By analyzing these responses, travel agencies can better understand travelers' preferences and gain valuable insights to help them create more targeted content (Farshid et al., 2018).

Tourism product marketing focuses on effectively presenting destinations and experiences to travelers. Creativity and the ability to communicate the unique and appealing aspects of a specific destination or service to potential travelers are key to success in this industry. One strategy is the use of "storytelling" to create narratives that emotionally engage and connect with travelers. This is often done through blogs, videos, and social media, which serve as additional tools to inform and attract potential customers (Kozak, 2001).

Neuromarketing uses a set of tools to examine how advertisements and scenic spots in tourism are perceived. Among these tools, commonly discussed in the literature (e.g., Alsharif et al., 2023; Garczarek-Bąk et al., 2021; Khondakar et al., 2024), are Galvanic Skin Response, Eye-Tracking, Facial Expression Analysis, Electroencephalography, and Magnetic Resonance Imaging. Our study employed a remote eye-tracker, as described in greater detail in the research methodology. Eye tracking is an experimental technique that monitors eye movements, enabling the precise identification of where a person is focusing their gaze and for how long. These systems measure eye position, movement, and pupil size in real-time to pinpoint areas of interest for the user (Klaib et al., 2021).

Previous eye-tracking research in advertising has primarily examined attention to brand elements, pictorial content and text layout in print and online ads (Pieters & Wedel, 2004; Wedel & Pieters, 2008), banners (Drèze & Hussherr, 2003; Hervet et al., 2011) and subtitles

in audiovisual media (d'Ydewalle & De Bruycker, 2007). These studies consistently show that text and centrally positioned elements capture attention efficiently, but they have rarely focused on tourism advertising or on the specific case of large text overlays that may compete with scenic visuals designed to convey destination atmosphere.

This issue is also supported by tourism-specific eye-tracking research. Li et al. (2016) showed that text embedded in tourism photographs affects viewers' visual attention and perceived advertising effectiveness. Similarly, Yang et al. (2022) demonstrated that image and text presentation forms in tourism advertisements influence perceived advertising effectiveness, destination affective image and visit intention. In the context of destination marketing videos, Alamäki et al. (2023) further showed that visual composition, including the use of scenery and people, affects emotional and behavioural responses to tourism video marketing.

This issue is particularly relevant in video and social media advertising, where text is often placed directly over the visual scene. Text and image then appear in the same visual field and compete for attention. Research on text overlays shows that their size and position are important design factors: large and centrally positioned text can increase salience, but it may also reduce the appeal of the visual content when it interferes with the image itself (Farace et al., 2026). In video advertising, this competition is dynamic because relevant elements change over time: a viewer may first attend to movement, then to a caption, and then return to the background or another salient object. Eye-tracking research confirms that attention to individual advertising elements is related to advertising effectiveness and that dynamic areas of interest can be used to analyse how attention is distributed across moving stimuli (Zhang & Yuan, 2018). Dynamic content can therefore influence not only where viewers look, but also when they look there, as changes in visual structure shape gaze allocation during exposure to video advertisements (Wooley et al., 2022; Yu et al., 2025). In the present study, this is important because the scenic background is not fixed and the text appears only in selected segments of the tourism video. Centrally placed captions are therefore understood as repeated visual anchors that appear in a privileged screen position and may redirect attention away from the surrounding destination scenery.

2.1 Visual Attention, Text–Image Interaction and Eye-Tracking in Advertising

Visual attention in advertising is shaped by bottom-up salience such as color and contrast and top down cognitive goals such as viewer intent or task. In print and display media, pictorial elements tend to attract initial attention regardless of size, whereas large, centrally positioned text commands attention more directly based on its prominence (Pieters & Wedel, 2004; Wedel & Pieters, 2008). Brand elements or logos placed near such captions can further reinforce focal areas within advertisements.

Spatial biases also influence gaze behavior. Humans exhibit a robust central fixation bias during scene viewing, meaning early eye movements often land near the center of the visual field even in the absence of strong visual cues. Centrally placed overlays therefore enjoy a positional advantage in seizing initial attention (Tatler, 2007; Bindemann, 2010).

Textual overlays also benefit from the ingrained tendency to read. Research on subtitling shows that when on screen captions appear, viewers almost automatically redirect gaze toward them. In digital advertising contexts, although so called banner blindness has been observed, studies indicate that banners congruent with surrounding content still receive at least one fixation and are more memorable (Drèze & Hussherr, 2003; Hervet et al., 2011).

This tendency is relevant because subtitles and advertising captions both require viewers to divide attention between written information and moving images. Although subtitles are

usually placed at the bottom of the screen and advertising captions may be placed centrally, both introduce verbal information into an audiovisual scene. Research on subtitle reading shows that viewers tend to look at subtitles when they appear, which indicates that written text can strongly guide gaze behaviour during video viewing (d'Ydewalle & De Bruycker, 2007). The timing of textual information also matters. Subtitle-reading studies show that subtitle speed and the presence of concurrent video influence eye movements, reading behaviour and comprehension (Szarkowska et al., 2024). When text is shown together with moving images, viewers have to decide how to allocate limited attention between reading and watching the scene. In advertising, this means that captions which appear too early, remain visible for too long or repeatedly occupy the same central region may become the dominant attentional target.

From a methodological point of view, central fixation bias creates a challenge for interpreting eye-tracking data in advertising research. Any element placed in the middle of the screen, including textual overlays, benefits from this positional advantage, so high attention to central text may reflect both its informational content and its privileged location. The present study therefore treats the attentional advantage of the central overlay region as the combined outcome of text content and central positioning and explicitly acknowledges this constraint as a limitation.

Recent advances in neuromarketing have reinforced these findings. Eye tracking studies show that strategically placed stimuli improve ad recall, as attention focused within a narrow region yields superior memory encoding compared to diffuse strategies, in line with the zoom lens model of attention (Bataineh & Almourad, 2025). A comprehensive review has mapped neuromarketing methods across the full consumer decision journey, highlighting their integration in pre purchase, purchase and post purchase stages (Gupta et al., 2025). In addition, new research emphasizes that both the complexity and realism of visual stimuli significantly affect gaze patterns and advertising effectiveness (Banytė et al., 2025).

Taken together, this evidence strongly suggests that centrally placed and high contrast text overlays in tourism advertising can capture attention rapidly and sustain it, potentially at the expense of scenic background engagement. This does not necessarily indicate alterations in fixation micro behaviors but rather disproportionate allocation of gaze toward text.

3. Methodology

We complemented descriptive heatmaps with inferential tests based on standard eye-tracking exports (IndividualAOImetrics, FixationTable, SaccadeTable) from the iMotions software. The methodological design is described in more detail in the following paragraphs.

Among several static and dynamic marketing stimuli presented in a broader neuromarketing session, the present analysis focuses on a 30-second tourism video called a scenic spot that promotes Egypt. The video combines panoramic destination footage with centrally placed white text slogans and calls to action that appear in the middle of the screen on top of the scenery. This design closely resembles typical tourism video advertisements used by destinations and travel brands to communicate both informational messages and atmospheric imagery. The key frames illustrated in Figures 1 to 3 represent segments with prominent central text overlays and a segment with scenery only.

The research sample consisted of 20 university students. Participants were recruited through convenience sampling at the university and took part voluntarily. The study was positioned as an exploratory pilot aimed at testing the proposed paradigm of text versus background attention rather than achieving broad generalizability. All participants provided informed consent and were debriefed after the session.

Given the exploratory pilot character of the study, no formal a priori power analysis was used to determine the sample size. However, a sensitivity consideration for a two-tailed paired-samples design with n = 20 indicates that the study is mainly sensitive to medium-to-large within-participant effects. Consequently, the findings should be interpreted as an initial test of the text-overshadowing pattern rather than as definitive population-level evidence.

After the eye-tracking recording, participants answered two yes or no questionnaire items. The first item (Q1) was: "Did you like the nature in the video?". The second item (Q2) was: "After watching the video, would you like to visit Egypt?". These items were included only as a simple check of overall evaluation. Given the small sample size and ceiling effects in the responses, they were not used in inferential analyses and are reported descriptively only.

Eye movements were recorded with a Smart Eye AI-X remote eye tracker sampling at 60 Hz, integrated with the iMotions software suite. Stimuli were presented on 24-inch UHD IPS monitors at a viewing distance of approximately 60 to 70 cm. Calibration and data quality were checked before analysis. A standard 9-point calibration and validation procedure was performed for each participant. Sessions were retained only when the iMotions diagnostic output indicated Good or Excellent calibration quality. Tracking quality was inspected before export, and recordings with failed calibration, clear non-compliance with the viewing task or insufficient valid gaze data for the analysed video would have been excluded. No participant was excluded after applying these criteria. Numerical validation-error values and detailed participant-level data-loss percentages were not retained for all participants; therefore, calibration quality is reported using the iMotions diagnostic categories. This is acknowledged as a methodological limitation.

Areas of Interest (AOIs) were defined to distinguish between two visually and conceptually relevant regions of the tourism video: the centrally placed textual overlay and the surrounding scenic background. The analysis was therefore based on a direct comparison between two AOI types: Text AOI and Background AOI. The Text AOI captured the central caption area, whereas the Background AOI captured the scenic destination imagery outside the caption region. Because the stimulus was a video rather than a static image, AOI metrics were interpreted only within the analysed video segments in which the comparison between caption and scenery was meaningful. The AOIs were not intended to represent all possible visual elements of the full 30-second video, but rather to test whether gaze was allocated more strongly to central text or to scenic background. Dwell time in milliseconds was treated as the primary measure of visual attention. Percentage-based dwell-time values were removed from the analysis and are not interpreted, because the substantive comparison can be reported more clearly and transparently using absolute dwell time, time to first fixation, hit time, confidence intervals and within-participant effect sizes.

Eye-tracking data were processed in iMotions and exported at the level of individual participants and areas of interest (AOIs). For each AOI type (Text and Background), we computed cumulative dwell time, fixation count, mean fixation duration, time to first fixation (TTFF), hit time, and saccade parameters. TTFF was defined as the elapsed time from AOI onset to the first fixation within the AOI. Hit time was defined as the elapsed time from segment onset to the first gaze entry into the AOI, regardless of subsequent fixation duration. Cumulative dwell time was defined as the total time spent fixating within the AOI across the analysed segments. Mean fixation duration was calculated as the average duration of individual fixations within the AOI. Because the same participants viewed both text and background regions, differences between Text and Background were examined using paired-samples t tests. Cohen's d_z was reported as the within-participant effect size, and 95% confidence intervals were used to emphasise estimation rather than relying solely on null-

hypothesis significance testing. Given the small sample size, all inferential results should be interpreted as exploratory and indicative. The analysis focuses on participant-level comparisons between AOIs. Time-resolved gaze dynamics were not modelled statistically and are therefore considered an important avenue for future research.

4. Results

By observing the scenic spot and using an eye tracker in a neuromarketing laboratory, we were able to gather important information about which visual components respondents attend to and for what duration specific elements of the video. The results section reports descriptive gaze visualizations and participant-level AOI comparisons between the central Text AOI and the scenic Background AOI. The analyses focus on dwell time, time to first fixation, hit time, mean fixation duration and saccade parameters.

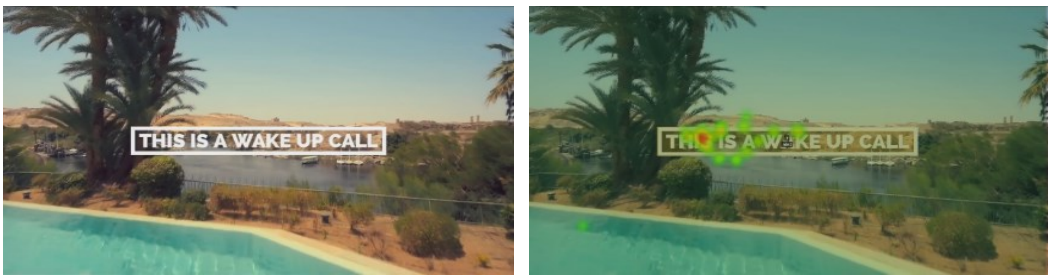

Figure 1: Video Segment with Central Caption and Gaze Visualization
Source: (own processing)

Figure 1 shows the first analysed segment of the tourism video, in which a centrally placed textual caption is superimposed over scenic background imagery. The background elements, including palm trees and a pool, represent visual cues commonly associated with relaxation, nature-based experience and destination atmosphere, which are relevant components of tourism advertising and scenic destination communication (Vespestad & Lindberg, 2011; Zhang & Xu, 2020). The gaze visualization indicates that viewers' fixations were concentrated mainly around the central caption area. This pattern is consistent with the general eye-tracking assumption that salient and centrally positioned visual elements can attract attention efficiently (Holmqvist & Andersson, 2017). In the present study, this visualization is interpreted descriptively as an indication that the Text AOI acted as a dominant attentional region within this segment.

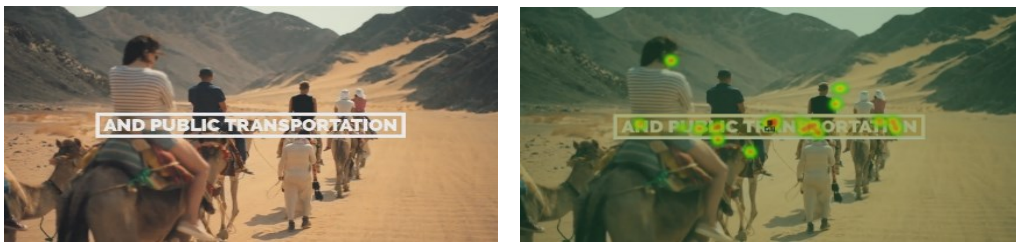

Figure 2: Second Video Segment with Central Caption and Gaze Visualization
Source: (own processing)

Figure 2 shows a second analysed segment with a centrally placed textual caption. Similar to Figure 1, the gaze visualization indicates a concentration of fixations around the caption area rather than an even distribution across the scenic background. This supports the descriptive observation that the caption region functioned as a salient attentional anchor in the analysed video segments. Such gaze concentration is relevant for neuromarketing research because eye-tracking allows researchers to identify which visual elements attract attention and how

visual attention is distributed across competing elements of an advertisement (Holmqvist & Andersson, 2017; Klaib et al., 2021). This descriptive pattern is further examined using participant-level AOI metrics in Table 1 and Table 2.

Table 1: Descriptive AOI Metrics for a Representative Analysed Segment

	Dwell time (ms)	First fixation duration (ms)	AOI duration (ms)
AOI1 – background	9110.95	216.87	27302.81
AOI2 – text	13767.1	217.21	27302.81

Source: (own processing)

Table 1 presents descriptive AOI metrics for one representative analysed segment. The table illustrates how attention was distributed between the central Text AOI and the scenic Background AOI before participant-level paired comparisons were calculated. Dwell time was higher for the Text AOI than for the Background AOI. The descriptive Text–Background difference was 4,656.15 ms, indicating that participants spent more time looking at the central caption area than at the surrounding scenery in this analysed segment. Percentage-based dwell-time values were removed to avoid ambiguity in interpretation.

To express this difference as a single summary index, we calculated AOIss as the dwell time in the text AOI minus dwell time in the background AOI. For Figure 2 this yielded AOIss = 13,767.10 ms − 9,110.95 ms = 4,656.15 ms, indicating that, on average, participants spent about 4.7 seconds more looking at the central text than at the surrounding scenery within the 30-second video.

Responses to the follow-up questionnaire showed that 100% of participants reported liking the nature shown in the video and that a large majority expressed an intention to visit Egypt. Because of the small sample size and the limited variability in these binary responses (strong ceiling effects), we did not attempt to correlate the questionnaire data with eye-tracking metrics; instead, they are used as a descriptive check that the scenic content was generally perceived positively despite receiving less visual attention than the text.

Figure 3: No-Text Video Segment with Central AOI Used for Anticipatory-Fixation Analysis
Source: (own processing)

In the frame illustrated in Figure 3, no text was present on screen, yet an AOI was defined in the same central region where captions appeared in the other analysed segments. When cumulative dwell time was compared between this central AOI and the surrounding background, the central region still attracted more attention: 9,400.80 ms compared with 4,673.53 ms for the background, a difference of 4,727.27 ms. This pattern is interpreted cautiously. Because the central AOI was located in the same region where captions appeared

in other segments, increased attention to this area may reflect a combination of central fixation bias, repeated exposure to the caption location and learned expectation about where relevant information appears. However, because the study did not include positional counterbalancing or a control video with captions placed elsewhere, this result should be treated as suggestive rather than conclusive evidence of anticipatory fixation.

Table 2: Paired comparisons of attention metrics between Text and Background AOIs

Metric	Text (T)	Background (B)	Δ (T–B)	95% CI	t	p	Cohen's dz
Fixation dwell time (ms)	34 375	23 119	11 256	[9198, 13 465]	9.75	<.001	2.18
Time to first fixation (ms)	72.9	522.8	–449.9	[–757, –200]	–3.10	.006	–0.69
Hit time (ms)	11.1	504.6	–493.5	[–868, –204]	–2.82	.011	–0.63
Gaze dwell time (ms)	43 888	25 054	18 834	[15 774, 22 197]	11.27	<.001	2.52

Source: (own processing)

Table 2 demonstrates that Text AOIs attracted substantially more visual attention than Background AOIs. Fixation dwell time was markedly longer on text (M = 34,375 ms) than on background (M = 23,119 ms), with an average within-participant difference of 11,256 ms. This difference was statistically significant and showed a very large effect size, $t(19) = 9.75$, $p < .001$, $dz = 2.18$. The same pattern was observed for gaze dwell time, where participants spent 18,834 ms more on text than on background, $t(19) = 11.27$, $p < .001$, $dz = 2.52$.

Temporal indices also confirmed the attentional advantage of text. Participants directed their first fixation to the Text AOI approximately 450 ms earlier than to the Background AOI, $t(19) = –3.10$, $p = .006$, $dz = –0.69$. Similarly, hit time was shorter for text than for background, indicating earlier gaze entry into the caption area, $t(19) = –2.82$, $p = .011$, $dz = –0.63$. Together, these results indicate that centrally placed text overlays captured attention earlier and held it for longer than the surrounding scenic background.

Table 3: Mean fixation duration by AOI class (paired tests)

Metric	Text (T)	Background (B)	Δ (T–B)	95% CI	t	p	Cohen's dz
Mean fixation duration (ms)	262.9	262.1	+0.7	[–8.5, 9.3]	0.15	.881	0.03

Source: (own processing)

The analysis of mean fixation duration revealed no reliable difference between text and background AOIs ($\Delta = 0.7$ ms, 95% CI [–8.5, 9.3], $t(19) = 0.15$, $p = .881$, $dz = 0.03$). In other words, once a fixation was made, its average length was virtually identical across conditions.

This null result is theoretically meaningful. It shows that the attentional advantage of text is not driven by changes in oculomotor control or by deeper cognitive processing that would prolong individual fixations. Instead, the pattern observed in Table 1 (much longer cumulative dwell times on text and earlier entry into text AOIs) is explained by where participants directed their gaze and how often they returned, not by differences in fixation microstructure.

From a neuromarketing perspective, this implies that text attracts attention by repeatedly capturing the gaze rather than by holding each fixation longer. In terms of visual communication theory, this finding strengthens the interpretation that the effect of central, high-contrast text is one of allocation and prioritization: the gaze system consistently favors text as a salient object, but once fixated, it is processed with the same temporal dynamics as background scenery.

This nuance is important for theoretical contribution: it differentiates attentional capture (macro-level allocation of fixations) from fixation processing (micro-level dwell duration), and it shows that the dominance of text overlays in scenic advertising occurs entirely at the level of gaze allocation.

Table 4: Saccade metrics by AOI class (paired tests)

Metric	Text (T)	Background (B)	Δ (T–B)	95% CI	t	p	Cohen's dz
Saccade amplitude (°)	4.83	4.70	+0.13	[0.00, 0.25]	1.93	.069	0.43
Saccade peak velocity (°/s)	139.9	138.5	+1.42	[–3.13, 5.14]	0.64	.532	0.14
Saccade duration (ms)	50.1	49.8	+0.32	[–0.42, 0.87]	0.93	.364	0.21

Source: (own processing)

The analysis of saccade dynamics showed only minor differences between text and background AOIs. Saccade amplitude tended to be slightly larger when directed toward text regions (Δ = 0.13°, 95% CI [0.00, 0.25]), approaching significance (p = .069, dz = 0.43). Similarly, saccade duration was marginally longer on text (Δ = 0.32 ms), with overlapping confidence intervals and non-significant results (p = .364). Peak velocity did not differ reliably between conditions (p = .532).

Taken together, Tables 1–4 provide descriptive and paired-comparison statistics for all eye-tracking variables analysed in the study. The descriptive pattern shows that the key indicators of visual attention, particularly fixation dwell time and gaze dwell time, reached higher values for text regions compared to the scenic background. In contrast, temporal measures such as time to first fixation were substantially shorter for text, indicating faster attentional capture. At the same time, mean fixation duration and saccade-related parameters showed no meaningful differences between the two conditions, suggesting that the observed effects are driven primarily by attentional allocation rather than differences in fixation processing. Given the participant-level AOI comparison structure of the exported eye-tracking data and the paired-comparison design, the descriptive reporting focuses on mean values, mean differences, confidence intervals and effect sizes for the Text–Background comparisons.

5. Discussion and Conclusions

The present study provides initial evidence that centrally placed text overlays in a tourism scenic spot can attract a disproportionate share of visual attention compared with the surrounding destination scenery. Across participants, cumulative dwell time, fixation count and time to first fixation consistently favored the text AOIs, while the scenic background received relatively less gaze despite being the core carrier of destination imagery.

At the same time, mean fixation duration and saccade dynamics were largely comparable between text and background regions. This pattern suggests that once a fixation occurs, basic oculomotor behavior is similar in both areas; what differentiates the text overlays is how often and how quickly the gaze returns to the central text region. Conceptually, our results are consistent with prior accounts of central fixation bias and attention to central captions and overlays in audiovisual media (Tatler, 2007) and extend this evidence to the specific context of tourism advertising.

From a practical perspective, the findings highlight a trade-off in tourism advertising design. Large, centrally placed slogans and calls-to-action appeared effective at capturing and recapturing attention in the present stimulus. However, this may come at the cost of reduced visual engagement with scenic elements that are intended to build an immersive sense of

place and emotional connection with the destination. Advertisers and destination marketers who rely heavily on central overlays should therefore consider using more subtle, temporally limited or spatially displaced text treatments that preserve the experiential value of the background imagery while still communicating essential information.

These findings also have practical implications for media planning and creative testing. Tourism marketers should not evaluate captions only in terms of message clarity, but also in terms of their effect on scenic engagement and destination image formation (Baloglu & McCleary, 1999; Echtner & Ritchie, 1993; Tasci & Gartner, 2007). A/B testing can be used to compare different caption strategies, such as central versus peripheral placement, early versus delayed appearance, short versus extended exposure, static versus moving text, and high-opacity versus semi-transparent visual treatment. This is consistent with research showing that the size and position of text overlays influence visual salience and the appeal of the visual content (Farace et al., 2026), while dynamic changes in video advertisements shape gaze allocation over time (Wooley et al., 2022; Yu et al., 2025; Zhang & Yuan, 2018). In such tests, effectiveness should not be measured only by recall of the written message, but also by attention to scenic imagery, emotional response, brand or destination attitude, and intention to visit.

A further practical implication is that visual attention should be connected to downstream communication outcomes. In the present study, the questionnaire items were used only descriptively and cannot establish whether reduced attention to scenery changes memory, emotion or behavioural intention. Future A/B tests should therefore combine eye-tracking with measures of scenic recall, caption recall, destination image, emotional response, attitude toward the destination and intention to visit. This would allow researchers and practitioners to determine whether central captions merely redirect gaze or whether they also weaken the persuasive and experiential value of tourism video advertising.

From a media-guideline perspective, captions should be timed and positioned so that they support the visual story rather than dominate it. Subtitle-reading research also suggests that the timing and speed of textual information can influence eye movements and reading behaviour during video viewing (Szarkowska et al., 2024). For scenic tourism videos, this may mean allowing the destination image to appear without text at the beginning of the clip, introducing captions with a short temporal delay, using shorter caption windows, avoiding repeated central placement, and placing key verbal messages in peripheral areas such as the lower or side parts of the frame. The opacity and contrast of captions should be adjusted so that the text remains readable without visually overpowering the destination image. Animated or moving text should be used cautiously, because motion can further increase visual salience and redirect attention away from scenic elements when the emotional value of the background is central to the advertisement.

Several limitations need to be acknowledged. First, the study used a small convenience sample of 20 university students. This limits statistical power and restricts generalizability to broader tourist populations. The study should therefore be interpreted as an exploratory pilot rather than as definitive population-level evidence. Second, the study relied on a single tourism video in which the captions were always centrally placed. As a result, the design cannot fully separate the effect of textual content from the positional advantage of the screen centre. The observed text advantage should therefore be interpreted as the combined effect of caption salience, readability and central fixation bias. Third, the analysis was based on selected AOI comparisons between text and background and did not model the full temporal dynamics of gaze allocation across the video. Future studies should use fully dynamic AOIs, time-resolved analyses, growth-curve models or mixed-effects models to examine when

attention shifts from scenery to text and whether this pattern changes across repeated caption appearances. Fourth, the anticipatory-fixation result is suggestive but not definitive, because no positional counterbalancing or control condition with peripheral captions was included. Fifth, numerical validation-error values and detailed participant-level data-loss information were not retained for all participants, which limits the transparency of data-quality reporting. Sixth, the follow-up questionnaire consisted of only two binary items and was not sufficient to test downstream outcomes such as recall, emotion, destination attitude or visit intention. Future research should combine eye-tracking with validated self-report scales and physiological or behavioural measures to examine whether attention shifts have meaningful consequences for tourism communication effectiveness.

Overall, the study illustrates how neuromarketing tools can provide initial evidence of possible unintended consequences of common advertising practices and may support the design of tourism video ads that better balance textual information with emotionally rich scenic content.

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