CROSS-CULTURAL RESPONSES TO ADVERTISEMENT DESIGN STYLES
A STUDY OF SUBJECTIVE EVALUATION AND VISUAL ATTENTION

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ABSTRACT

This study explores cross-cultural affective responses to culturally inspired advertisement design styles by integrating subjective evaluation and eye-tracking measures. Chinese and Japanese participants evaluated AI-generated product advertisements designed in three Kansei-oriented styles: Chinese, Japanese, and German. The stimuli covered five product categories. A total of 60 participants completed a Kansei evaluation questionnaire, and a subset of 30 participants underwent eye-tracking using a Tobii Pro Spark. The results showed that advertisement style had a clearer influence on affective evaluation than participant nationality. Chinese-style advertisements elicited higher perceived self-fit and purchase/use intention, whereas German-style advertisements evoked higher trustworthiness; Japanese-style advertisements tended to receive lower ratings. Participant nationality showed relatively limited effects on subjective evaluation. Eye-tracking results showed that visit count produced the clearest nationality-related pattern, with Chinese participants revisiting advertisements more frequently than Japanese participants. Visit count showed a moderate positive association with fixation duration, but little association with subjective evaluation items, suggesting that repeated viewing may reflect visual engagement, comparison, or confirmation rather than direct positive evaluation. These findings demonstrate the value of combining subjective responses and eye-tracking measures to understand cross-cultural affective responses to advertisement design.

Keywords: *Cross-culture, Affective design; Advertisement; Eye tracking; Visual attention*

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1 INTRODUCTION

In globalized consumer markets, advertisements are increasingly designed for audiences from different cultural backgrounds. Advertisement design does not only communicate product information but also conveys culturally embedded meanings through visual style and persuasive cues.

Previous studies have shown that advertising appeals matched with consumers' cultural backgrounds and product-use conditions can influence advertising effectiveness [1]. Therefore, understanding how culturally embedded visual cues evoke specific emotional and Kansei responses is crucial for both cross-cultural marketing and Kansei engineering.

Previous studies on cross-cultural advertising have often examined advertising effectiveness through self-reported evaluations, such as attitude toward the advertisement, perceived trustworthiness, and purchase intention. Research on ad-self congruency also suggests that the perceived fit between an advertisement and the consumer's self-concept can affect ad evaluation and purchase-related responses [2].

However, subjective evaluation alone cannot fully reveal consumers' visual processing during advertisement viewing.

To address this issue, the present study combines questionnaire evaluation and eye-tracking data to examine cross-cultural responses to advertisement design styles. Since visual attention to advertisement elements plays an important role in advertisement processing [4], integrating subjective evaluation with eye-tracking measures can provide a more comprehensive understanding of how advertisement style influences consumer responses.

Specifically, this study compares Chinese and Japanese participants' responses to three advertisement design styles: Chinese-style, Japanese-style, and German-style advertisements. The advertisement stimuli were generated as virtual product posters based on reference advertisements from each country, allowing culturally different design styles to be compared under the same product categories.

Five product categories were used as stimuli. Subjective evaluations, including ease of 1) understanding, 2) naturalness, 3) attractiveness, 4) trustworthiness, 5) self-fit, and 6) purchase/use intention, were collected using a 5-point scale, and visual attention was measured using Tobii eye-tracking indicators, including time to first fixation, fixation duration, and visit count.

The purpose of this study is to examine whether subjective evaluation and visual attention show consistent or different patterns, and whether cultural differences emerge differently across stages of visual attention.

2 RELATED WORK AND RESEARCH AIM

Cross-cultural advertising research has shown that consumers' responses to advertisements are influenced by cultural values, communication styles, and familiar visual expressions. Advertisements congruent with consumers' cultural backgrounds or product-use contexts may be evaluated more positively because they are easier to understand and more consistent with consumers' expectations [1]. However, advertising effectiveness cannot be explained only by national or cultural congruency. Research on ad-self congruency suggests that consumers may respond more favorably when an advertisement feels personally relevant or fits their self-concept [2].

In Kansei engineering, culturally meaningful visual styles can be regarded as design stimuli that evoke psychological and emotional responses [3]. Therefore, advertisement style may influence multiple dimensions of consumer evaluation, such as self-fit, trustworthiness, and purchase/use intention. However, self-reported evaluation alone cannot fully reveal how consumers visually

process advertisements. Eye-tracking can complement questionnaire data by capturing visual attention during advertisement viewing. Previous advertising research has used eye-tracking to examine how attention is distributed across advertisement elements, such as images, text, and brand information [4].

Based on this background, the present study explores how Chinese and Japanese participants respond to Chinese-, Japanese-, and German-style advertisements across subjective evaluation and eye-tracking indicators. Because advertisement style involves multiple visual and semantic elements, this study treats it as a composite design condition rather than an isolated single-variable manipulation.

3 METHOD

3.1 Participants

A total of 60 participants completed the questionnaire survey. Thirty participants were Chinese and thirty participants were Japanese. Participants were between 20 and 40 years old. Among them, 30 participants also took part in the eye-tracking experiment, including 15 Chinese participants and 15 Japanese participants. All participants had normal or corrected-to-normal vision

3.2 Stimuli

The stimuli consisted of advertisements for five product categories: beverages, mattresses, earrings, computers, and game consoles. For each product category, three advertisement design styles were prepared: Chinese-style, Japanese-style, and German-style advertisements. Thus, a total of 15 advertisement stimuli were used in the experiment.

The advertisements were created as virtual product posters rather than real commercial advertisements. Reference posters from China, Japan, and Germany were collected through online searches and used to identify representative visual characteristics, such as layout, color, information density, imagery, typography, and textual expression. Based on these references, a text-to-image generative AI tool was used to generate posters for fictional products. The generated posters were then screened and selected by the researchers to ensure that each stimulus reflected the intended style while avoiding real brands, existing products, or identifiable commercial materials.

To reduce the “black-box” nature of AI-generated stimuli, the main visual characteristics of the three styles were summarized after generation and screening, as shown in Table 1.



Advertisement style was treated as a composite design condition rather than an isolated manipulation of a single visual variable. Therefore, the terms Chinese-style, Japanese-style, and German-style refer to visual advertising style cues generated and selected for this experiment, rather than direct representations of national cultures as a whole.

Figure 1. Example of AI-generated advertisement stimuli used in the experiment. The advertisements were generated based on reference posters from each country and were used as culturally inspired design style conditions.

Table 1. Summary of visual characteristics of the three advertisement styles.

Style	Main visual characteristics	Design interpretation
Chinese	Relatively high information density; vivid colors; compact layout; stronger decorative or promotional elements	Emphasis on visual richness, promotional impact, and expressive presentation
Japanese	Higher whitespace; softer color tones; restrained composition; balanced arrangement of image and text	Emphasis on subtlety, balance, calmness, and gentle impression
German	Minimalist composition; stronger contrast; clearer grid-like layout; product-centered presentation; functional typography	Emphasis on clarity, functionality, order, and reliability

3.3 Procedure

In each trial, three advertisements from the same product category were presented simultaneously on the screen. The presentation position was fixed: the Japanese-style advertisement was placed on the left, the Chinese-style advertisement in the center, and the German-style advertisement on the right. The stimulus order was also fixed across participants.

For the questionnaire survey, participants evaluated the advertisements using a 5-point Likert scale. For the eye-tracking experiment, participants were seated in front of the display, and their eye movements were recorded using a Tobii Pro Spark eye tracker. The eye tracker was calibrated before the task. The Tobii Pro Spark records gaze data at 60 Hz under its default setting. Each advertisement image was defined as an area of interest.

After viewing the advertisements, participants completed subjective evaluations.

3.4 Measure

3.4.1 Questionnaire Measures

Subjective evaluations were collected using a 5-point scale. The questionnaire consisted of six items related to understandability, naturalness, attractiveness, trustworthiness, self-fit, and purchase/use intention, as shown in Table 2. Higher scores indicated more positive evaluations.

Table 2. **Questionnaire items used for subjective evaluation**

Construct / Item	Description
Ease of understanding	The advertisement is easy to understand.
Naturalness	The advertisement feels natural and has little sense of incongruity.

Attractiveness	The advertisement is attractive.
Trustworthiness	The advertisement appears trustworthy.
Self-fit	The advertisement feels targeted toward me / domestic consumers.
Purchase/use intention	I would like to purchase or use the product.

3.4.2 Eye-Tracking Measures

Eye movements were recorded using a Tobii Pro Spark eye tracker. Three eye-tracking indicators were analyzed: time to first fixation, fixation duration, and visit count. Time to first fixation was used as an indicator of initial attention capture. Fixation duration was used as an indicator of visual engagement or information processing. Visit count was used as an indicator of repeated viewing or revisiting behavior.

3.5 Data Analysis

For the questionnaire data, mean scores were calculated for each participant, advertisement style, and evaluation item. The six questionnaire items were analyzed separately.

For the eye-tracking data, time to first fixation, fixation duration, and visit count were analyzed for each advertisement style. Data were averaged across the five product categories for each participant before statistical analysis. Mixed-design analyses of variance were conducted with participant nationality as a between-subject factor and advertisement style as a within-subject factor. When significant main effects or interactions were found, post-hoc pairwise comparisons were conducted. Statistical significance was set at $p < .05$.

4 RESULTS

4.1 Subjective Evaluation

Subjective evaluation ratings were analyzed for six items: 1) understandability, 2) naturalness, 3) attractiveness, 4) trustworthiness, 5) self-fit, and 6) purchase/use intention. The following analysis focuses on three items most directly related to affective advertising effectiveness: 5) self-fit, 6) purchase/use intention, and 4) trustworthiness. Understandability, naturalness, and attractiveness were treated as supplementary items for checking the general impression and basic quality of the stimuli.

Fig. 2 shows boxplots of participant-level mean ratings for self-fit, purchase/use intention, and trustworthiness. For each measure, ratings were averaged across the five product categories for each participant and advertisement style before visualization. Participant nationality was included as a between-subject factor in the statistical analyses, but ratings were combined across nationality groups in Fig. 2 to show the overall advertisement-style pattern.

JP-style advertisements tended to receive lower ratings across the three representative items. CN-style advertisements showed relatively higher ratings for self-fit and purchase/use intention, whereas DE-style advertisements showed the highest ratings for trustworthiness.

For self-fit, a mixed-design ANOVA showed a significant main effect of advertisement style, $F(2,116) = 15.47$, $p < .001$, $\eta p^2 = .211$. The main effect of nationality and the interaction were not significant. Bonferroni-corrected pairwise comparisons showed that CN-style and DE-style advertisements were rated significantly higher than JP-style advertisements, while CN-style and DE-style advertisements did not differ significantly.

For purchase/use intention, significant main effects were found for nationality, $F(1,58) = 5.50$, $p = .022$, $\eta p^2 = .087$, and advertisement style, $F(2,116) = 19.98$, $p < .001$, $\eta p^2 = .256$. Japanese

participants gave higher purchase/use intention ratings overall than Chinese participants. Pairwise comparisons showed that CN-style and DE-style advertisements were rated significantly higher than JP-style advertisements, with no significant difference between CN-style and DE-style advertisements. The interaction was not significant, $F(2,116) = 2.78$, $p = .066$.

For trustworthiness, advertisement style also showed a significant main effect, $F(2,116) = 29.90$, $p < .001$, $\eta p^2 = .340$. The main effect of nationality and the interaction were not significant. DE-style advertisements received the highest trustworthiness ratings, followed by CN-style and JP-style advertisements. Post-hoc comparisons indicated that DE-style advertisements were rated significantly higher than JP-style advertisements in both nationality groups.

Overall, the subjective evaluation results indicate that advertisement style had a clearer effect than participant nationality. JP-style advertisements were evaluated less positively, whereas CN-style and DE-style advertisements received higher evaluations in different dimensions.

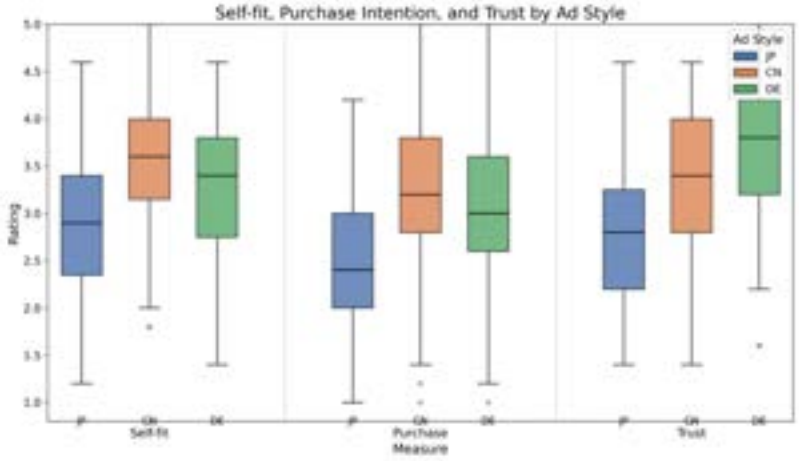

Fig. 1. Boxplots of self-fit, purchase/use intention, and trustworthiness by advertisement style. For each measure, participant-level mean ratings are shown for JP-, CN-, and DE-style advertisements.

4.2 Subjective Evaluation by Participant Nationalit

To examine nationality-related tendencies in subjective evaluation, the six questionnaire items were compared between Chinese and Japanese participants. Fig. 3 shows boxplots of participant-level mean ratings for understandability, naturalness, attractiveness, trustworthiness, self-fit, and purchase/use intention. Ratings were averaged across advertisement styles and product categories for each participant before visualization.

Japanese participants showed slightly higher median ratings for several items, particularly attractiveness, self-fit, and purchase/use intention. However, the distributions of the two nationality groups largely overlapped across the six items.

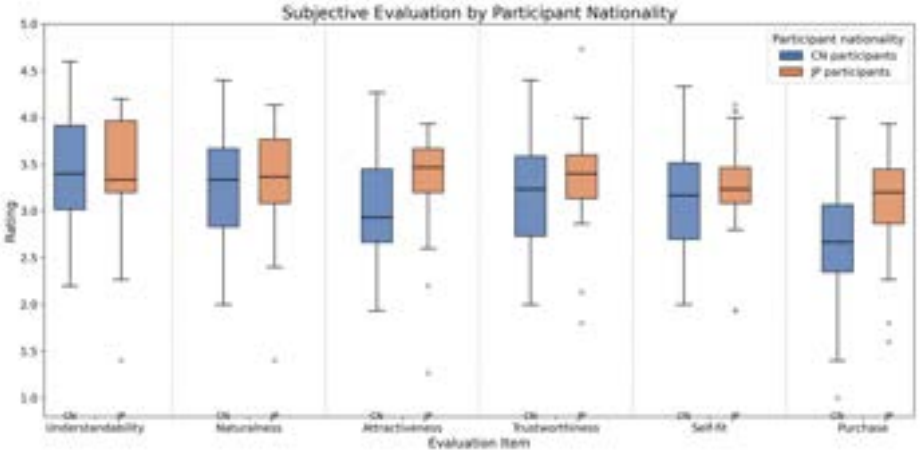

Fig. 2. Boxplots of six subjective evaluation items by participant nationality. Each box represents the distribution of participant-level mean ratings for Chinese and Japanese participants. Ratings were averaged across advertisement styles and product categories for each participant before visualization.

4.3 Eye-Tracking Measures

Eye-tracking data were analyzed using three indicators: time to first fixation (TTFF), fixation duration, and visit count. TTFF was used to examine initial attention capture, fixation duration was used to examine visual engagement, and visit count was used to examine repeated viewing behavior.

Because the presentation position of each advertisement style was fixed across trials, TTFF was not interpreted as a direct indicator of advertisement style preference. Instead, it was treated as a descriptive baseline reflecting initial viewing tendency under the fixed layout.

TTFF showed a significant main effect of advertisement style and a significant interaction with nationality. However, because advertisement style and screen position were fixed, TTFF was interpreted only as a style/position-related baseline rather than as evidence of advertisement-style preference.

For fixation duration, a significant main effect of advertisement style was found ($F(2,56) = 3.90$, $p = .026$). The main effect of participant nationality was not significant ($F(1,28) = 1.66$, $p = .209$), and the interaction did not reach statistical significance, ($F(2,56) = 2.89$, $p = .064$). Post-hoc comparisons suggested that the nationality difference was significant only for JP-style advertisements, indicating that cultural differences in viewing duration were limited.

Visit count showed the clearest nationality-related pattern. Significant main effects were found for participant nationality($F(1,28) = 21.90$, $p < .001$), and advertisement style ($F(2,56) = 32.38$, $p < .001$). The interaction was also significant, ($F(2,56) = 4.51$, $p = .015$). As shown in Fig. 4, Chinese participants tended to show higher visit counts than Japanese participants across all three advertisement styles, although the distributions overlapped to some extent. Post-hoc comparisons confirmed that this nationality difference was significant for CN-, DE-, and JP-style advertisements.

To further examine the meaning of repeated viewing behavior, correlation analyses were conducted between visit count and selected measures, including fixation duration, TTFF, self-fit, purchase/use intention, and trustworthiness. Spearman's rank correlation was used because the eye-tracking sample size was relatively small and visit count was treated as a behavioral indicator of repeated viewing. The correlations were calculated at the condition level based on nationality × product category × advertisement style combinations.

As shown in Table 3, visit count showed a moderate positive association with fixation duration (correlation $\rho = .502$, $p < .005$). This suggests that advertisements revisited more frequently tended to receive longer total visual attention. In contrast, visit count showed little association with TTFF (correlation $\rho = .081$, $p = .675$), or with the selected subjective evaluation items, including self-fit, purchase/use intention, and trustworthiness.

Overall, the eye-tracking results indicate that TTFF was strongly affected by the style/position condition, fixation duration showed limited cultural differences, and visit count showed the clearest nationality-related difference. The correlation analysis further suggests that visit count may be more closely related to visual engagement than to subjective preference or positive evaluation.

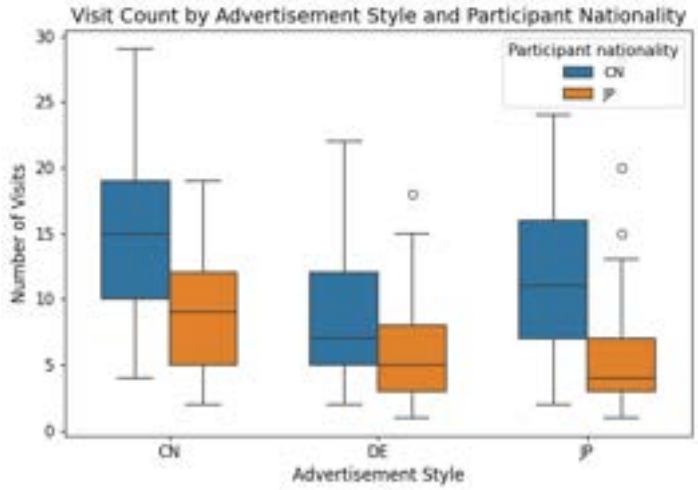

Fig. 3. Boxplots of visit count by advertisement style and participant nationality. Each box represents the distribution of participant-level mean visit counts for Chinese and Japanese participants.

Table 3. Spearman correlations between visit count and selected measures.

Measure	Spearman's ρ	p-value	Significance
Fixation duration	.502	.005	Yes
TTFF	.081	.675	-
Self-fit	.039	.837	-
Purchase/use intention	-.071	.711	-
Trustworthiness	-.130	.495	-

Note. Correlations were calculated at the condition level based on nationality × product category × advertisement style combinations.

5 DISCUSSION

5.1 Subjective Evaluation and Advertisement Style

The subjective evaluations reveal a distinct style-driven rather than nationality-driven pattern. The association of DE-style advertisements with trustworthiness and CN-style advertisements with self-fit and purchase/use intention suggests that culturally inspired visual cues may trigger different affective dimensions of advertising evaluation.

CN-style advertisements may have triggered stronger emotional resonance, familiarity, and perceived approachability. This indicates that visually familiar or emotionally accessible styles may be effective in evoking positive Kansei connections with consumers' self-concept. Rather

than simply reflecting a preference for one's own cultural background, this result suggests that certain visual styles may enhance perceived relevance and emotional closeness.

DE-style advertisements, on the other hand, appeared to evoke stronger cognitive and affective trust. One possible explanation is the country-of-origin effect [5]. Country-related visual cues may activate consumers' existing associations with particular countries, even when the products themselves are fictional and not actually produced in those countries. In this study, DE-style advertisements may have activated associations such as precision, functionality, reliability, and technological sophistication. These associations may have contributed to the higher trustworthiness ratings observed for DE-style advertisements.

Overall, the results do not support a simple interpretation that consumers always prefer advertisements from their own cultural background. Instead, advertisement style appears to influence evaluation through multiple Kansei dimensions, such as perceived relevance, emotional resonance, purchase appeal, and trust. In this sense, culturally inspired advertisement styles should be understood not only as visual aesthetic variations, but also as cues that may activate broader product- and country-related associations.

5.2 Participant Nationality and Subjective Evaluation

The comparison between Chinese and Japanese participants suggests that participant nationality did not strongly separate subjective evaluation patterns. Although some items showed slightly higher ratings among Japanese participants, the overlap between the two groups indicates that nationality alone was not the dominant factor shaping affective responses.

Rather than showing a straightforward local-style preference, participants from both nationality groups appeared to respond to the affective meanings conveyed by visual style, such as familiarity, self-relevance, trustworthiness, and perceived product quality.

From a Kansei design perspective, this result indicates that cultural style should not be treated as a fixed national label. Rather, culturally inspired visual cues may function as design resources that communicate different affective values. A familiar and expressive style may enhance self-fit and purchase/use intention, whereas a clearer and more functional style may enhance trustworthiness. Therefore, the effect of advertisement style should be interpreted in relation to the intended Kansei value rather than only in relation to the nationality of the target audience.

5.3 Eye-Tracking Results and Visual Attention

The eye-tracking results provided additional insight into how participants visually processed the advertisements. TTFF showed strong differences among advertisement style conditions, but because advertisement style and screen position were fixed, it was interpreted only as a supplementary baseline of initial viewing tendency rather than as an indicator of style preference.

Fixation duration showed a weaker pattern. Although advertisement style had a significant main effect, nationality-related differences were limited and appeared mainly in the JP-style condition. This suggests that total viewing time was not consistently shaped by participant nationality.

In contrast, visit count showed the clearest nationality-related difference, with Chinese participants revisiting advertisements more frequently than Japanese participants across all three styles. This indicates that repeated viewing behavior may be more sensitive to participant background than initial fixation timing or total viewing duration. The correlation analysis further showed that visit count was associated with fixation duration but not with subjective evaluation items, suggesting that frequent revisiting may reflect visual engagement, comparison, or confirmation rather than direct preference, trust, or purchase intention.

This pattern may be related to culturally shaped information-search strategies. Previous studies on holistic and analytic cognitive styles suggest that cultural background can influence how people distribute visual attention across objects, contexts, and relationships [7, 8]. However, because both Chinese and Japanese participants belong to East Asian cultural contexts and cognitive style was not directly measured, this interpretation should be treated as exploratory.

Overall, the eye-tracking results suggest that the clearest nationality-related difference appeared in repeated viewing behavior rather than in subjective evaluation. This supports the value of combining questionnaire data with eye-tracking measures when studying cross-cultural responses to advertisement design.

5.4 Design Implications

These findings suggest that culturally inspired advertisement styles should be selected according to the intended Kansei value rather than the nationality of the target audience. Expressive and familiar styles may support self-fit and purchase/use intention, whereas clear and functional styles may enhance trustworthiness. In addition, repeated viewing should not be interpreted as direct preference, because visit count may reflect comparison or confirmation rather than positive evaluation.

6 LIMITATIONS AND CONCLUSION

6.1 Limitations

This study has several limitations. First, advertisement style was treated as a composite condition including layout, color, imagery, typography, and textual expression; therefore, the effects of individual design elements cannot be isolated. Second, the presentation position of each style was fixed, so TTFF should be interpreted cautiously as a style/position-related measure. Third, the AI-generated stimuli may have reflected simplified or stereotypical representations of national advertising styles, and the eye-tracking sample size was relatively small. Future studies should counterbalance stimulus positions, validate perceived cultural style, manipulate specific design elements, and use larger samples across more product categories.

6.2 Conclusion

This study examined Chinese and Japanese participants' responses to Chinese-, Japanese-, and German-style advertisements by combining subjective evaluation and eye-tracking data. Advertisement style showed a clearer influence on subjective evaluation than participant nationality. CN-style advertisements were associated with higher self-fit and purchase/use intention, whereas DE-style advertisements were associated with higher trustworthiness; JP-style advertisements tended to receive lower ratings. Eye-tracking results showed that visit count, rather than TTFF or fixation duration, revealed the clearest nationality-related pattern, with Chinese participants revisiting advertisements more frequently. Because visit count was associated with fixation duration but not with subjective evaluation, repeated viewing may reflect visual engagement, comparison, or confirmation rather than direct preference. These findings demonstrate the value of combining subjective and eye-tracking measures to understand cross-cultural Kansei responses to advertisement design styles.

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