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# Understanding the Impact of Cultural Heritage Design Infusion on Brand Evaluation: Boundary Conditions of Repeated Exposure on Social Media

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## Abstract

**Background and Research Gap:** Driven by both digital marketing and the growing emphasis on cultural confidence, cultural heritage elements have been widely incorporated into product design and brand marketing. However, within the information–overloaded environment of social media, it remains unclear whether excessive exposure may weaken the positive effects generated by cultural heritage design infusion. Empirical evidence on this issue is still limited.

**Methods:** Drawing on the art infusion effect and aesthetic fatigue theory, this study develops a moderated mediation model to examine the mechanism through which cultural heritage design infusion influences consumer brand evaluation.

**Research Design:** Three progressive online experiments (N = 839) were conducted. Using ANOVA, Linear Mixed Models (LMM), and PROCESS Macro, the study analyzed consumers' responses to different types of cultural heritage design under varying levels of exposure frequency.

**Key Findings:** The results indicate that both tangible and intangible cultural heritage design infusion significantly enhance consumers' perceived cultural value, thereby improving brand evaluation. However, repeated exposure on social media acts as a critical boundary condition moderating this process. As exposure frequency increases, consumers experience aesthetic fatigue, which significantly weakens the positive impact of cultural heritage design infusion on brand evaluation.

**Contributions:** This study is among the first to introduce aesthetic fatigue theory into the research on cultural heritage design infusion. It reveals the pattern of diminishing

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marginal utility of cultural elements in digital marketing contexts and provides both theoretical insights and practical guidance for brands in developing effective exposure strategies in cross-sector collaborations and digital marketing.

**Keywords:** cultural heritage design infusion; brand evaluation; perceived cultural value; repeated exposure; aesthetic fatigue; cross-innovation design

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## 1. Introduction

### 1.1. Research Background

In today's highly competitive product market, enhancing brand value through product design has become a central concern for enterprises. In recent years, with the rise of global cultural confidence and the emergence of the "Guochao" (national trend) movement, integrating cultural heritage (CH) elements into product design has become an important cross-disciplinary innovation strategy[1]. From the Palace Museum's cultural and creative cosmetics to modern apparel incorporating intangible cultural heritage (ICH) craftsmanship, and to smart electronic products inspired by traditional patterns, cultural heritage design infusion (CHDI) has demonstrated strong market appeal[2,4].

This design strategy not only endows products with distinctive cultural meanings but also provides brands with significant opportunities for premiumization[3]. From the perspective of interdisciplinary design innovation, the deep integration of technology, business, and culture is reshaping consumer perceptions and experiences.

### 1.2. Research Questions

Although cultural heritage design infusion can generate significant positive effects initially, a critical issue has emerged in the era of digital marketing: when consumers are repeatedly exposed to homogeneous cultural heritage design products via social media and other channels, do these positive effects still persist?

Specifically, this study focuses on the following core questions: under conditions of repeated exposure on social media, what is the mechanism through which cultural heritage design infusion influences consumer brand evaluation? Does excessive exposure produce a "fatigue" effect, thereby weakening the commercial value of the design?

### 1.3. Current Research

Existing research has mainly focused on the Art Infusion Effect. Hagtvedt and Patrick (2008) [1] first proposed that the presence of visual art can independently enhance consumer evaluation of products by increasing perceived luxury, regardless of the specific content of the art. Subsequently, scholars have extensively explored the mechanisms of art infusion, including emotional transfer, the halo effect, and contagion effects[5,6,7,8]. In recent years, some studies have begun to examine the application of Traditional Cultural Properties in product design, confirming that incorporating cultural elements can enhance purchase intentions among younger consumers [9,10].

However, most of these studies assume that the positive effects of cultural or artistic elements are constant and pay little attention to the dynamic influence of external environmental factors such as exposure frequency.

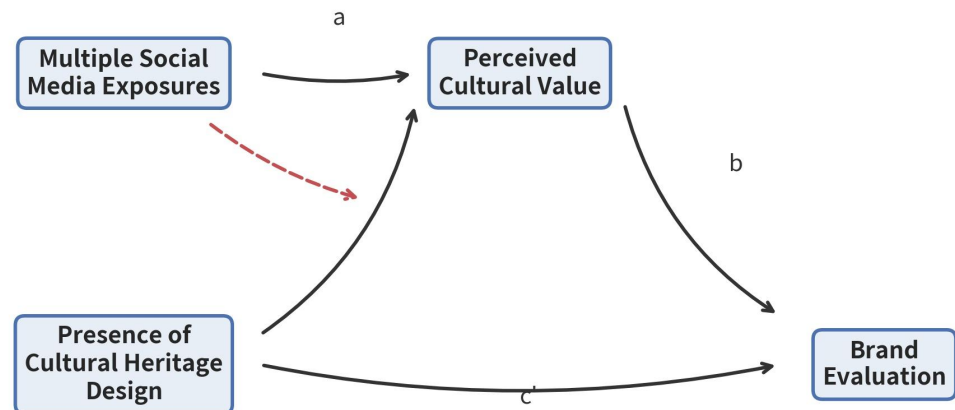
#### *1.4. Research Gaps*

Although prior research has laid a foundation for understanding design infusion effects, notable limitations remain. First, most studies focus on the infusion of Western classical or modern art[11], whereas research on cultural heritage design infusion, which embodies profound historical and cultural significance, is relatively limited and lacks systematic empirical investigation from the perspective of interdisciplinary design innovation[12].Second, in the digital era, consumer information channels are highly concentrated on social media. Existing research on art infusion often overlooks repeated exposure as a critical real-world boundary condition[13]. Psychological research on the Mere Exposure Effect suggests that repeated exposure initially increases preference, but excessive exposure can lead to satiation and fatigue[14]. However, this theory has not yet been effectively integrated into marketing models of cultural heritage design infusion.

#### *1.5. Research Objectives and Positioning*

This study aims to address the above gaps by introducing aesthetic fatigue theory and constructing a moderated mediation model in which repeated exposure serves as a moderating variable (Figure 1) . The methodological approach follows a “modeling first, then validation” strategy.Three progressive quantitative experiments were conducted. First, the study confirms the positive effects of cultural heritage design infusion. Second, it validates the fatigue phenomenon induced by repeated exposure. Finally, it comprehensively tests the moderating role of repeated social media exposure on the relationship between perceived cultural value and brand evaluation.The scope of this study is strictly limited to visual-level cultural heritage design infusion, excluding potential confounding effects from functional or technological product improvements. In summary, cultural heritage design infusion

can enhance brand evaluation by increasing perceived cultural value; however, high-frequency repeated exposure on social media triggers aesthetic fatigue, significantly weakening this positive effect.



**Figure 1.** Theoretical Model of This Study.

### 1.6. Structure of the Paper

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature and develops research hypotheses. Section 3 describes the research methodology and experimental design in detail. Section 4 introduces the data sources and preprocessing procedures. Section 5 presents the data analysis results and key findings. Section 6 provides an in-depth discussion and interpretation of the results. Finally, the paper concludes by summarizing the main findings and identifying limitations and future research directions.

## 2. Related Work

### 2.1. Justification of the Research Topic

With the deepening of the experience economy, consumers' expectations toward products have shifted from purely functional attributes to emotional resonance and cultural meaning. In this context, cultural heritage is no longer merely an object of preservation but has become an important source of interdisciplinary design innovation[15].

Previous studies on the Art Infusion Effect, notably those by Hagtvedt and Patrick (2008)[4], demonstrate that incorporating artistic elements into product design can enhance product attractiveness by increasing perceived luxury, independent of the specific artistic content[16, 17]. However, compared with general

works of art, cultural heritage embodies stronger elements of collective memory, national identity, and historical depth.

When cultural heritage is transformed through design and integrated into products—referred to as cultural heritage design infusion—its underlying mechanism may extend beyond the perception of luxury and instead manifest primarily as perceived cultural value. Existing literature often treats cultural elements as equivalent to general artistic elements and fails to highlight the distinctive cultural premium mechanism associated with cultural heritage. This limitation constitutes the first major motivation for the present study.

Moreover, in the marketing environment dominated by digital social media, consumers are exposed to an overwhelming volume of visual information daily. Many previous studies have validated the positive effects of artistic or cultural elements in controlled laboratory settings involving single or static exposure, which diverges substantially from contemporary commercial realities. Therefore, examining how dynamic exposure frequency constrains or moderates the design infusion effect is both theoretically innovative and practically urgent.

## *2.2. Core Literature and Theoretical Foundations*

The theoretical framework of this study is grounded in three core perspectives: design infusion theory, the halo effect, and classical conditioning theory.

First, regarding design infusion, Gupta and Joshi (2023)[5] conducted a systematic review indicating that the infusion of visual elements can significantly alter consumers' cognitive evaluations of otherwise unrelated products. Within the context of cultural heritage, Zhang et al. (2023) [18] found that cultural identification associated with intangible cultural heritage (ICH) products significantly increases consumers' purchase intentions. These findings suggest that the visual representation of cultural heritage can function as a powerful symbolic cue, communicating value to consumers beyond the physical attributes of the product.

Second, the halo effect and classical conditioning explain the mechanism underlying such value transfer. When consumers encounter products incorporating cultural heritage elements, the heritage itself—associated with exquisite craftsmanship, historical continuity, and aesthetic significance—acts as an unconditioned stimulus, generating positive psychological responses. Through repeated associative processes, these positive responses become transferred to the product or brand (the conditioned stimulus), thereby forming perceived cultural value and enhancing overall brand evaluation[19, 20].

Based on this theoretical reasoning, the following hypotheses are proposed:

- H1: Cultural heritage design infusion has a significant positive effect on brand evaluation;

- H2: Perceived cultural value mediates the relationship between cultural heritage design infusion and brand evaluation.

### *2.3. Cross-Disciplinary Perspectives: Aesthetic Fatigue and Repeated Exposure*

To better capture consumer psychological dynamics in the digital marketing environment, this study introduces the concepts of aesthetic fatigue and the Mere Exposure Effect from psychology and museum studies.

The Mere Exposure Effect, proposed by Zajonc (1968)[14], suggests that repeated exposure to a stimulus generally increases individuals' preference for it. However, subsequent meta-analyses conducted by Montoya et al. (2017) [21] indicate that this effect follows an inverted U-shaped pattern: once a certain threshold is reached, continued exposure leads to declining preference due to satiation or habituation.

In studies of visual art and museum experiences, this phenomenon is often described as museum fatigue or art fatigue [22, 23]. Research by Mikuni et al. (2022)[24] demonstrates that repeatedly viewing homogeneous artworks in laboratory settings results in reduced attention and significantly lower aesthetic evaluations.

In today's highly developed social media environment, brands frequently promote successful cultural heritage collaborations through high-frequency, multi-channel digital marketing campaigns. According to cognitive resource theory, when consumers are exposed to large amounts of homogeneous cultural visual stimuli within a short period, cognitive overload may occur. Such excessive exposure may not strengthen cultural identification; instead, it can generate feelings of boredom and psychological desensitization—namely aesthetic fatigue[25, 26, 27].

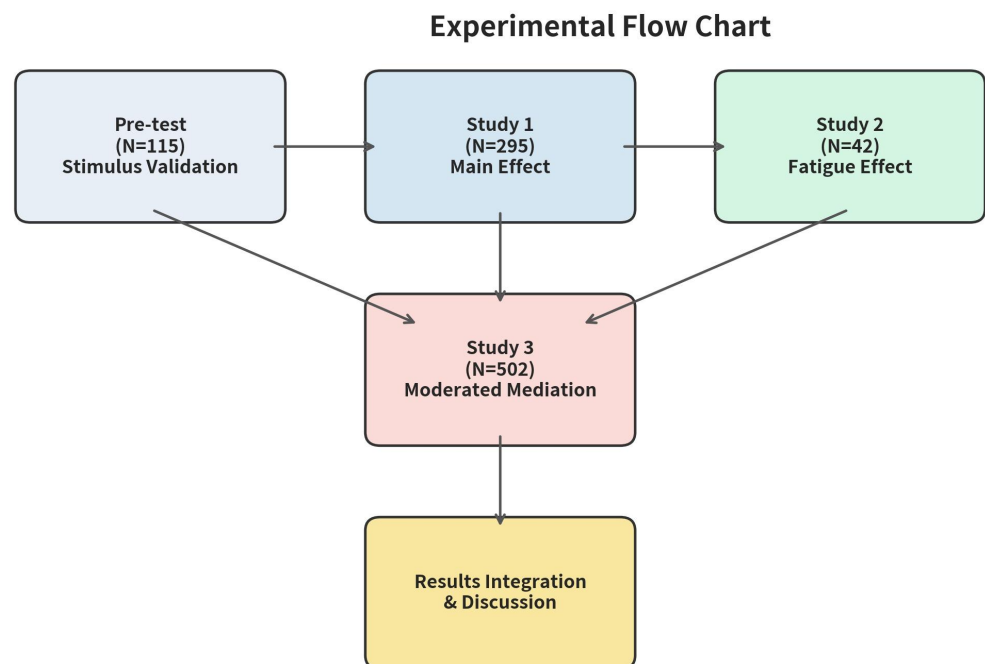
This fatigue can weaken the sense of sacredness and scarcity originally associated with cultural heritage design, thereby disrupting the transfer pathway implied by the halo effect[28]. Based on these cross-disciplinary theoretical insights, this study proposes the following moderating hypotheses:

- H3: Repeated exposure on social media significantly moderates the relationship between cultural heritage design infusion and perceived cultural value. Specifically, as exposure frequency increases, the positive impact of cultural heritage design infusion on perceived cultural value gradually weakens;
- H4: Repeated exposure on social media moderates the mediating effect of perceived cultural value in the relationship between cultural heritage design infusion and brand evaluation, forming a moderated mediation model. Under low exposure frequency, the mediating effect is significant; under high exposure frequency, this mediating effect is significantly weakened.

### 3. Methodology

#### 3.1. Research Strategy

This study adopts an “establish–then–validate” research strategy, using three progressive online behavioral experiments to test the proposed theoretical hypotheses (Figure 2) . Study 1 aims to verify the existence of the cultural heritage design infusion effect at a basic level, testing H1. Study 2 independently examines the aesthetic “fatigue” effect caused by high–frequency repeated exposure by simulating a social media browsing environment. Study 3 serves as the core comprehensive experiment, manipulating different levels of exposure frequency to fully test the moderated mediation model, addressing H2, H3, and H4. To ensure the scientific rigor and reproducibility of the experiments, all studies adhered to the principles of randomization, control, and independent replication.



**Figure 2.** Overall Experimental Procedure of This Study.

#### 3.2. Data Collection

The study data were collected via professional online survey platforms, such as Sojump (Wenjuanxing) and Qualtrics. The target population comprised active consumers aged 18–45 with a certain level of social media usage.

Variable Design:

- Independent Variable (IV): Cultural heritage design infusion (categorical variable: infusion vs. no infusion);

- Dependent Variable (DV): Brand evaluation (continuous variable), measured using a 7–point Likert scale covering dimensions such as “negative–positive” and “dislike–like.”[29];
- Mediating Variable (M): Perceived cultural value (continuous variable), measured using a 7–point Likert scale including items such as “rich cultural heritage” and “strong sense of historical continuity.”;
- Moderating Variable (W): Repeated exposure on social media (manipulated in Study 3 as three levels of visual stimuli: 1, 10, and 20 exposures).

Core Control Variables / Confounding Factors: To minimize interference from prior brand preferences, low–familiarity fictitious brands (e.g., “LUMOS” tea set / cultural creative brand) were used. In addition, participants’ interest in art/cultural heritage and prior brand familiarity were included as covariates in the model.

Data Structure: The data were cross–sectional, with each sample including demographic information, scale scores, and experimental group assignment. To ensure data quality, attention check items were embedded in the questionnaire, and participants with professional backgrounds in art or design were excluded [30].

### 3.3. Experimental Design and Data Analysis

Experimental Materials and Pre–test: The target stimuli were selected from traditional Chinese tea sets (teacups) as the base product. In the cultural heritage design infusion group, the product surfaces incorporated the classical Cloisonné “rattan lotus” pattern, a nationally recognized intangible cultural heritage (ICH). In the no–infusion control group, simple geometric patterns or plain color designs were used. A pre–test (N = 115) was conducted, and an independent–samples t–test confirmed that participants could significantly distinguish the two sets of images in terms of their cultural heritage attributes ( $M_{\text{infusion}} = 5.82$  vs.  $M_{\text{no infusion}} = 3.15$ ,  $t = 16.34$ ,  $p < 0.001$ ), validating the effectiveness of the stimuli.

1. Study 1: Main Effect of Cultural Heritage Design Infusion;
  - Study 1 employed a single–factor between–subjects design (Cultural Heritage Design: Infusion vs. No Infusion). A total of 295 valid responses were collected. Participants were randomly assigned to one of the two conditions, viewed product images, and subsequently completed perceived cultural value and brand evaluation scales;
  - Analysis: One–way ANOVA was used to examine differences in brand evaluation between groups; Process Macro (Model 4, Hayes, 2022) was applied for simple mediation analysis, using 5,000 bootstrap resamples to estimate 95% confidence intervals.
2. Study 2: Aesthetic Fatigue Effect of Repeated Exposure;

- Drawing on the paradigm of Mikuni et al. (2022)[24], Study 2 (N = 42) simulated a social media browsing experience similar to Instagram or Xiaohongshu feeds. Participants sequentially viewed and rated 100 images of cultural–heritage–inspired creative products, with each image presented for 3–15 seconds;
  - Analysis: Aesthetic pleasure ratings were used as the outcome variable, and trial number (1–100) served as the predictor; Considering the repeated–measures nature of the data, Linear Mixed Models (LMM) were constructed in R (lme4 package), including random intercepts for both participants and images to precisely assess the decline in ratings as exposure increased.
3. Study 3: Moderated Mediation Model Test.
- Study 3, the core experiment, employed a 2 (Cultural Heritage Design: Infusion vs. No Infusion) × 3 (Repeated Exposure: 1 vs. 10 vs. 20 exposures) between–subjects design. A total of 502 valid participants were recruited and screened; During the experimental procedure, participants first browsed target brand images embedded in a simulated social media feed alongside distractor images, then evaluated the target brand. Additionally, participants reported their psychological fatigue on a 1 (“not at all fatigued”) to 9 (“extremely fatigued”) scale to verify the manipulation.
  - Analysis: Manipulation checks were conducted using ANOVA; Moderated mediation analysis was performed using Process Macro (Model 7, Hayes, 2022)[31]. In the model, cultural heritage design infusion served as the independent variable, perceived cultural value as the mediator, brand evaluation as the dependent variable, and exposure frequency as the first–stage moderator. Brand familiarity and cultural interest were included as covariates. The Index of Moderated Mediation and its bootstrap confidence interval were reported; All parameter tests were preceded by checks for normality (skewness and kurtosis within  $\pm 2$ ) and homogeneity of variance[32].

## 4. Data

### 4.1. Data Source and Basic Information

The data for this study were collected between October and November 2025 via professional online survey platforms (Sojump/Wenjuanxing and Qualtrics). The data collection period lasted four weeks. All participants were informed that the data would be used solely for academic research and provided informed consent.

A total of 839 valid responses were included in the final analysis (Study 1: N = 295; Study 2: N = 42; Study 3: N = 502). The demographic characteristics were generally representative: 58.4% female, with a mean age of 28.6 years (SD = 6.34).

Descriptive statistics of key variables are presented below (Study 3 example, 7-point Likert scales):

- Perceived Cultural Value: M = 4.62, SD = 1.35, Median = 5.0, Range = [1.0, 7.0];
- Brand Evaluation: M = 4.88, SD = 1.28, Median = 5.0, Range = [1.0, 7.0];
- Art/Cultural Interest (Covariate): M = 4.15, SD = 1.42.

#### 4.2. Data Preprocessing

After exporting the raw data in CSV format, data preprocessing was conducted using Python (Pandas library) and SPSS 27.0. The cleaning procedure included the following steps:

- Invalid Sample Removal: Participants who completed the survey in less than 90 seconds (considered careless responses) or failed two attention check items (e.g., “Please select ‘Strongly Disagree’ for this item”) were excluded. Across the entire study, approximately 31.5% of the initially recruited participants were removed due to these criteria (e.g., in Study 3, 733 participants were recruited, with 502 valid responses retained);
- Missing Data Handling: For a very small proportion of missing responses (<1%) caused by network interruptions, mean imputation was applied;
- Distribution Checks: All continuous variables were tested for normality. Results indicated that skewness values ranged from -0.85 to 0.42 and kurtosis values ranged from -1.12 to 0.78, all well within the acceptable threshold of  $\pm 2$ , satisfying the assumptions for parametric tests. Additionally, variance inflation factors (VIFs) were all below 3.0, indicating no serious multicollinearity issues [33, 34].

## 5. Results

### 5.1. Study 1 Results: Main Effect of Cultural Heritage Design Infusion

The one-way ANOVA results indicated that cultural heritage design infusion had a significant positive effect on brand evaluation. As expected, participants in the infusion group rated the target brand significantly higher (M<sub>infusion</sub> = 5.45, SD = 0.92) than those in the no-infusion control group (M<sub>no infusion</sub> = 4.32, SD = 1.15),  $F(1, 293) = 87.64$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.23$ . This finding objectively confirms that the visual incorporation of cultural heritage elements can enhance consumers' overall evaluation of a product, supporting Hypothesis H1 (Figure 3, Figure 4).

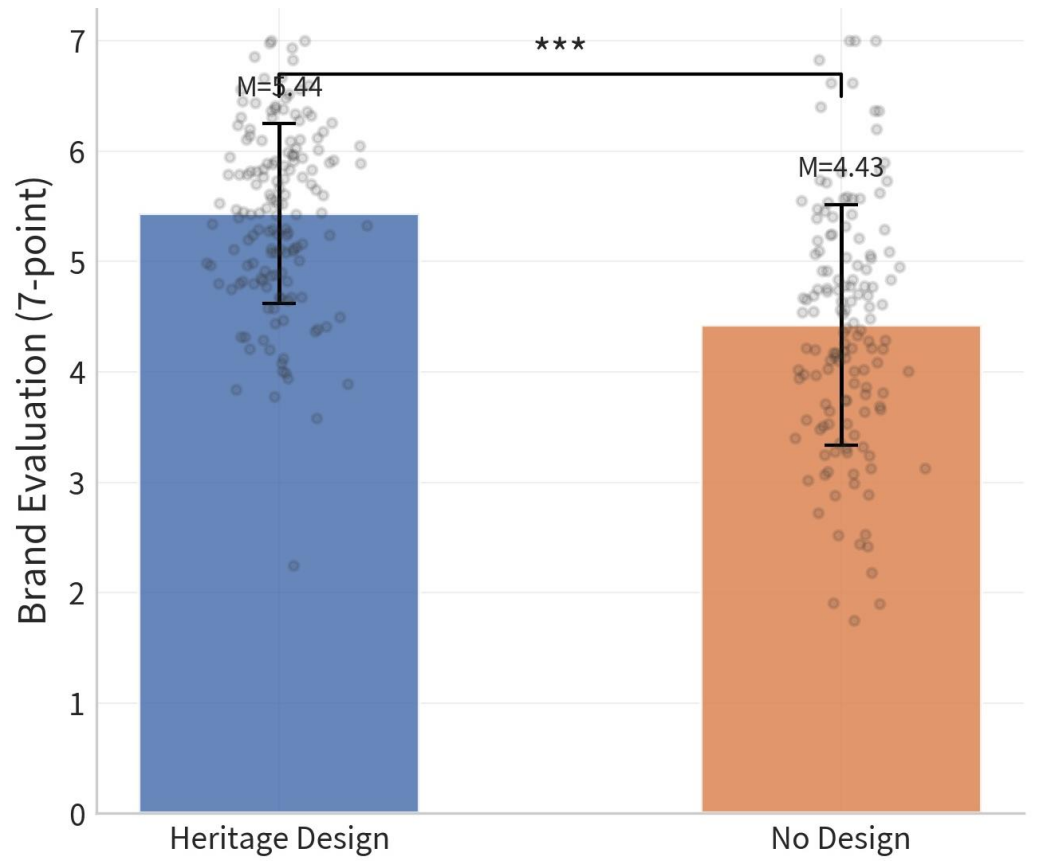


Figure 3. Differences in Brand Evaluation Across Conditions in Study 1.

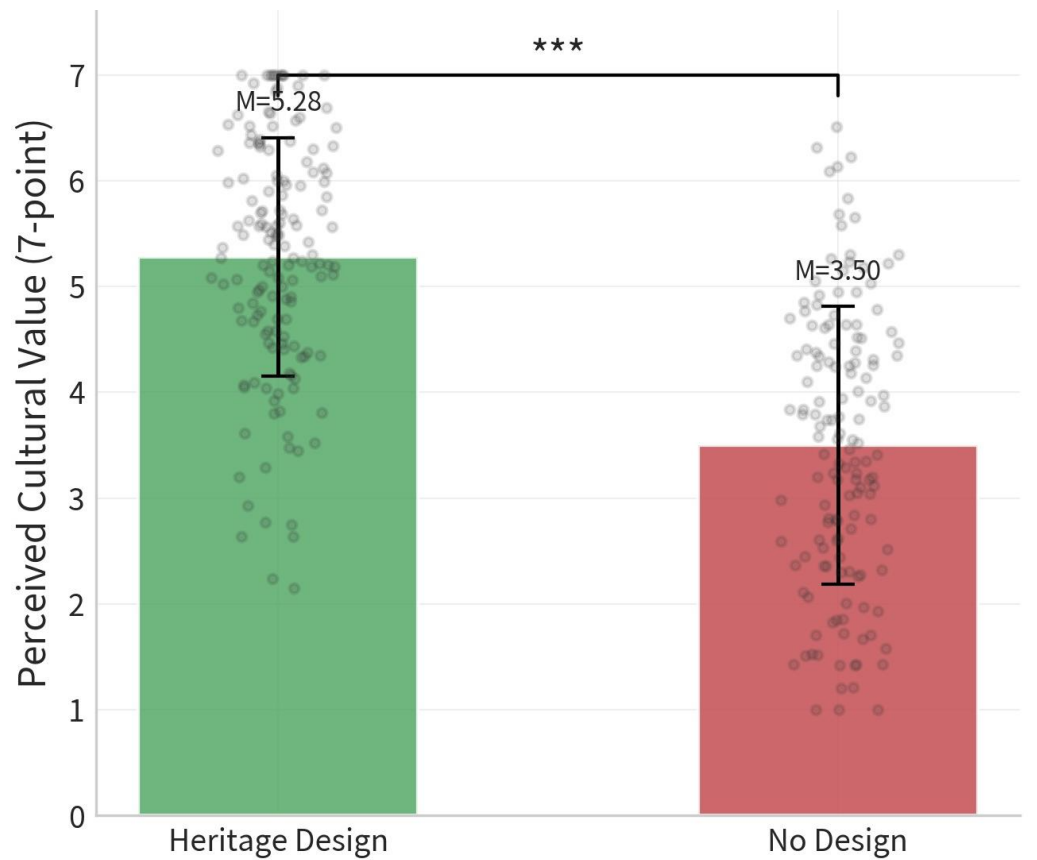
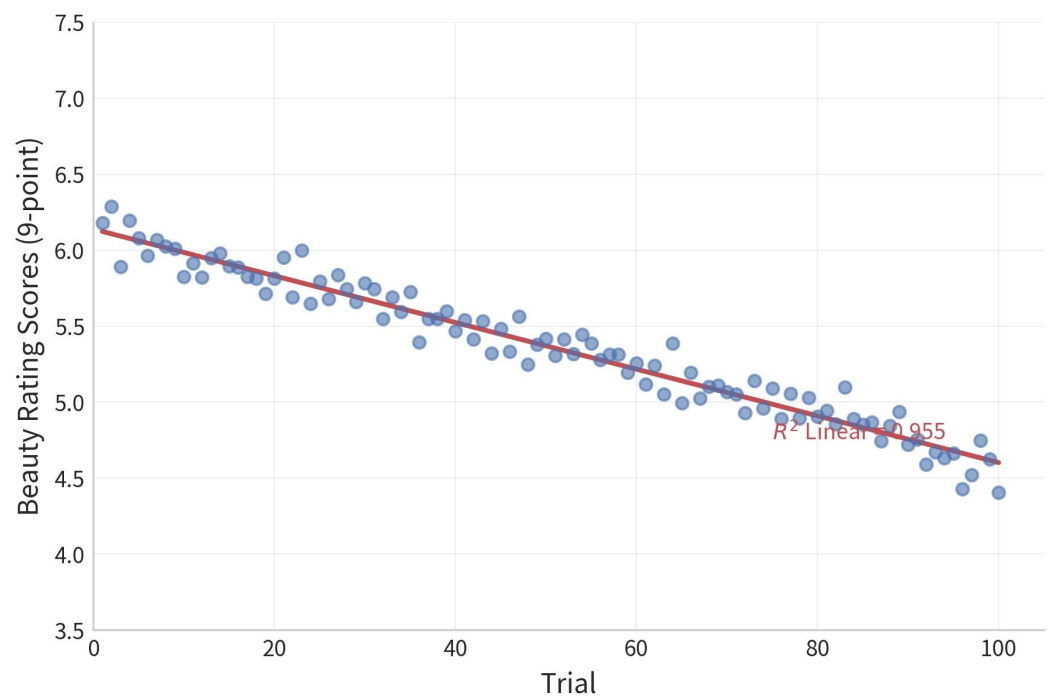


Figure 4. Differences in Perceived Cultural Value Across Conditions in Study 1.

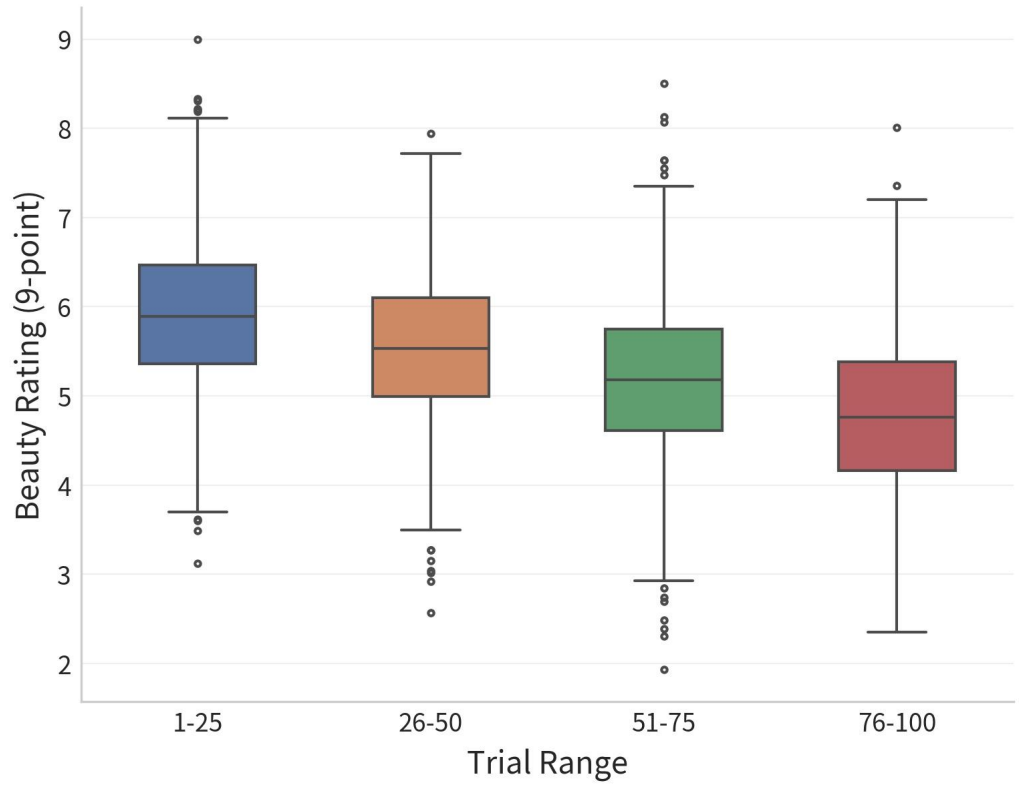
In the mediation analysis (Model 4), perceived cultural value was found to fully mediate the relationship between cultural heritage design infusion and brand evaluation. Design infusion significantly increased perceived cultural value (Coeff = 1.28, SE = 0.14,  $t = 9.14$ ,  $p < 0.001$ ), and perceived cultural value, in turn, positively predicted brand evaluation (Coeff = 0.52, SE = 0.06,  $t = 8.66$ ,  $p < 0.001$ ). Bootstrap analysis indicated that the indirect effect was significant (Effect = 0.66, 95% CI = [0.48, 0.85], not including 0), providing preliminary support for Hypothesis H2.

### 5.2. Study 2 Results: Aesthetic Fatigue Effect of Repeated Exposure

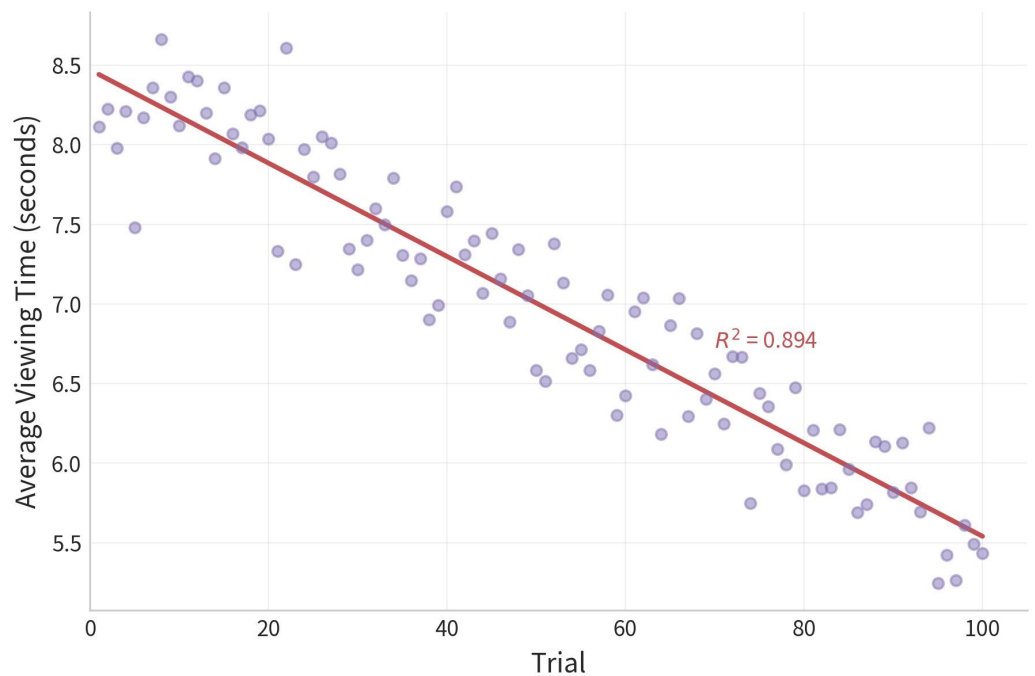
The Linear Mixed Model (LMM) analysis in Study 2 revealed a significant declining trend in aesthetic evaluation. As participants viewed an increasing number of cultural heritage product images (Trial 1 to 100), their average aesthetic pleasure ratings showed a significant decrease. Specifically, the LMM results indicated a significant negative main effect of trial number (continuous predictor) on aesthetic ratings (Estimate =  $-0.015$ , SE = 0.003,  $t = -5.02$ ,  $p < 0.001$ ). A scatterplot with a fitted regression line visually illustrates this “diminishing marginal utility” phenomenon. These findings suggest that high-frequency visual exposure in social media-like contexts induces aesthetic fatigue among consumers, providing solid empirical support for the subsequent moderated mediation analyses (Figure 5, Figure 5, Figure 7).



**Figure 5.** Declining Trend of Aesthetic Pleasure Ratings with Increasing Exposure in Study 2.



**Figure 6.** Distribution of Aesthetic Pleasure Across Different Exposure Stages in Study 2.



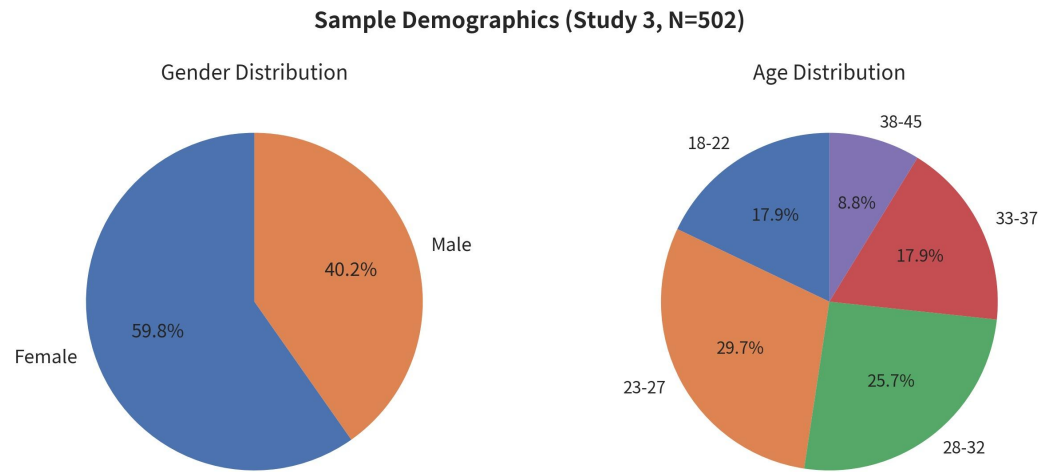
**Figure 7.** Decline in Average Viewing Time with Increasing Exposure in Study 2.

### 5.3. Study 3 Results: Moderated Mediation Model

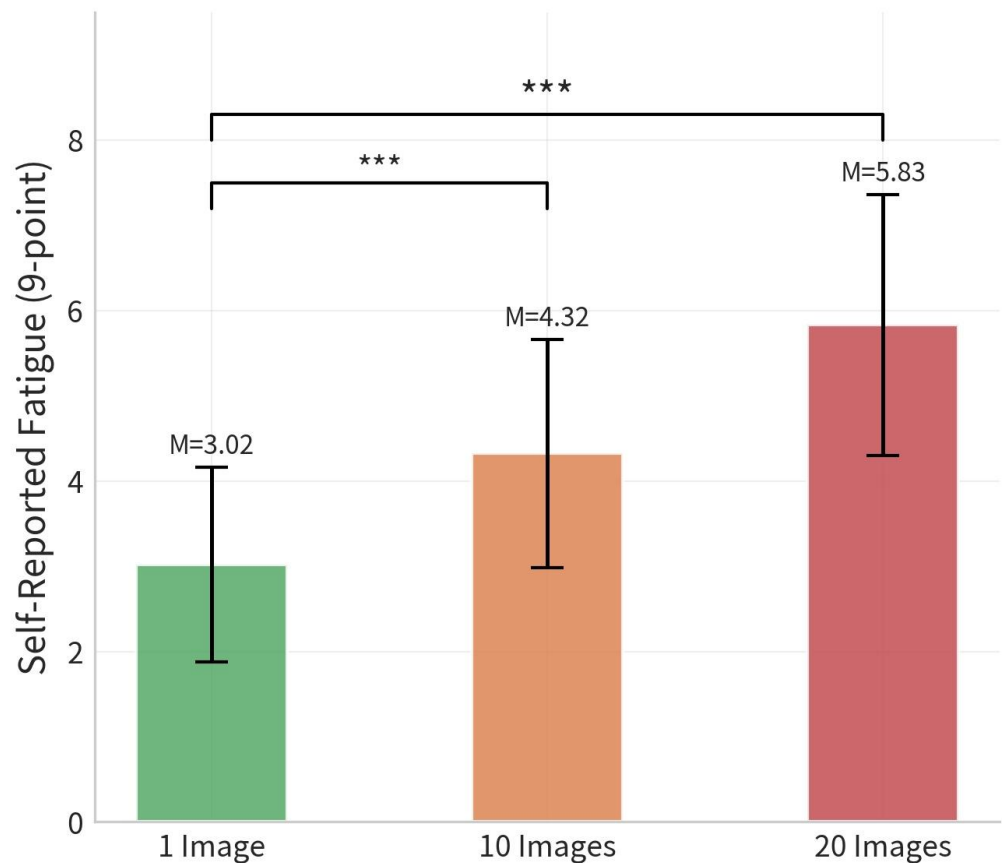
#### 5.3.1. Manipulation Check and Baseline Analysis

For the manipulation check of psychological fatigue, a one-way ANOVA revealed significant differences in self-reported fatigue among the exposure groups (1, 10, and

20 exposures) ( $F(2, 499) = 34.52, p < 0.001$ ). Post-hoc comparisons with Bonferroni correction indicated that participants in the 20-exposure group reported significantly higher fatigue ( $M = 5.88, SD = 1.45$ ) than those in the 10-exposure group ( $M = 4.35, SD = 1.32$ ) and the 1-exposure group ( $M = 3.12, SD = 1.20$ ), confirming the effectiveness of the repeated exposure manipulation. Baseline distributions of demographic variables and covariates were balanced across groups, ensuring comparability prior to the main analyses (Figure 8, Figure 9).



**Figure 8.** Demographic Characteristics of Participants in Study 3.



**Figure 9.** Differences in Self-Reported Fatigue Across Exposure Groups in Study 3.

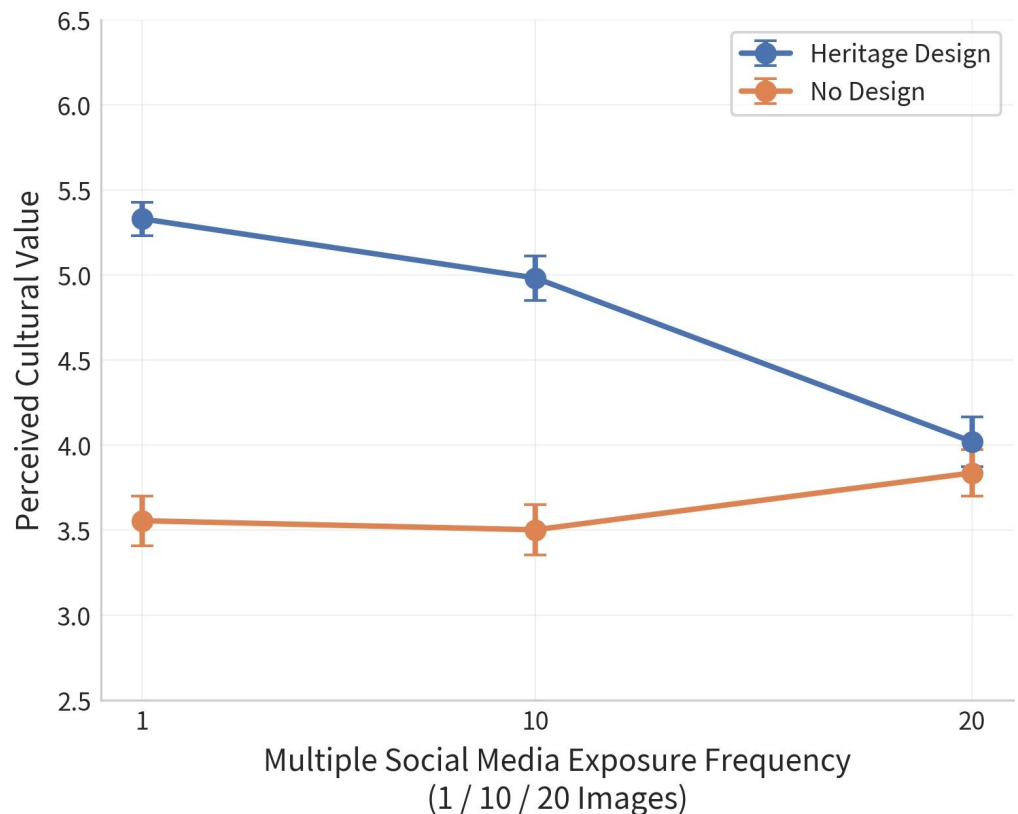
5.3.2. Moderation Analysis

The moderating role of repeated exposure was tested using Process Macro . Results indicated that the interaction between cultural heritage design infusion and exposure frequency (X × W) significantly and negatively predicted perceived cultural value (Coeff = -0.045, SE = 0.012, 95% CI = [-0.068, -0.021]).

Simple slope analysis further revealed that:

- Under low-frequency exposure (1 exposure), the positive effect of design infusion on perceived cultural value was strongest and highly significant (Effect = 0.85, p < 0.001);
- Under medium-frequency exposure (10 exposures), the positive effect remained significant but was attenuated (Effect = 0.45, p < 0.01);
- Under high-frequency exposure (20 exposures), the positive effect was substantially weakened and approached marginal significance (Effect = 0.12, p = 0.08 > 0.05).

This significant negative moderation trend provides empirical support for Hypothesis H3, indicating that high-frequency repeated exposure diminishes the positive impact of cultural heritage design infusion on perceived cultural value(Figure 10).

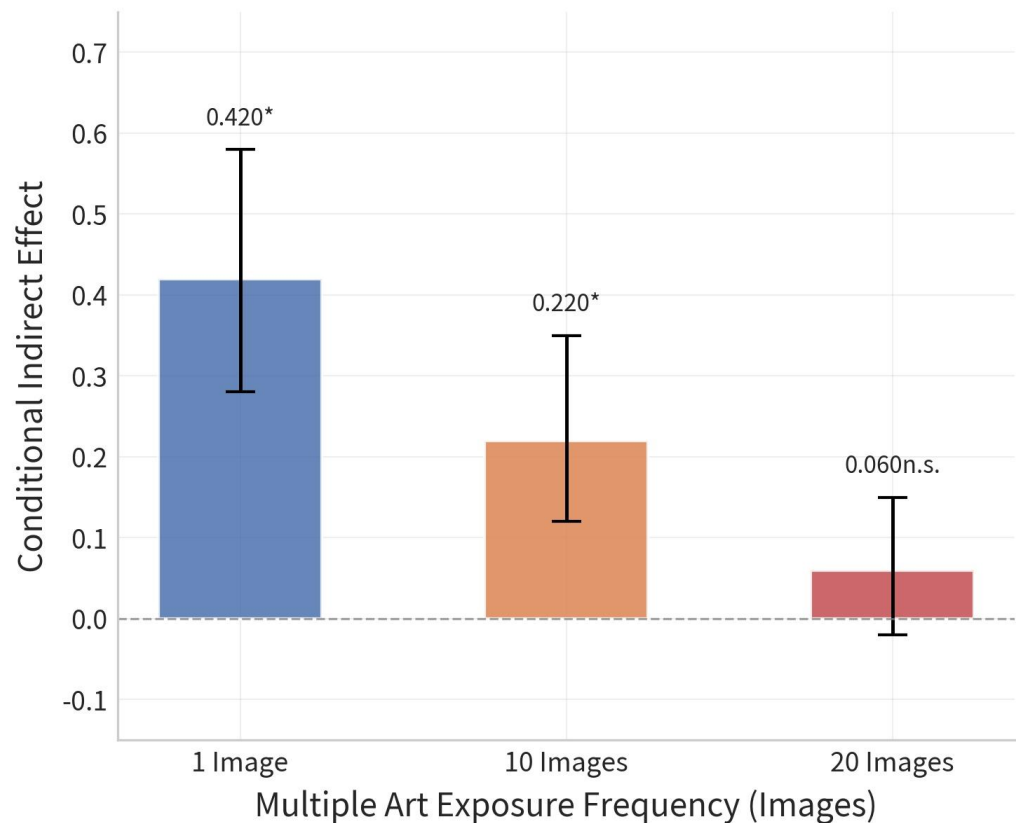


**Figure 10.** Moderating Effect of Repeated Exposure on the Relationship Between Cultural Heritage Design Infusion and Perceived Cultural Value.

### 5.3.3. Moderated Mediation

Further analysis confirmed the moderated mediation mechanism (H4). The Index of Moderated Mediation was significantly negative (Index =  $-0.028$ , SE =  $0.008$ , 95% CI =  $[-0.045, -0.013]$ , not including 0). Specifically, the indirect effect via perceived cultural value varied dynamically across exposure levels (Figure 11):

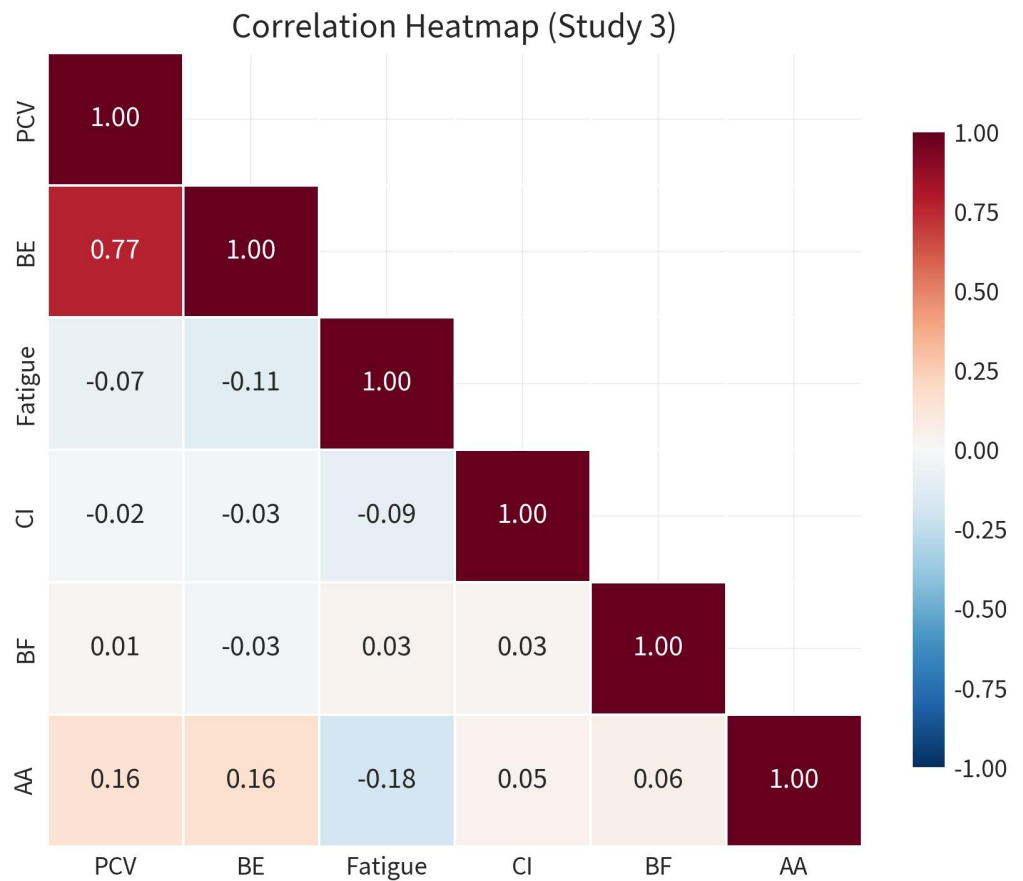
- At 1 exposure, the indirect effect was strongest (Effect =  $0.42$ , 95% CI =  $[0.28, 0.58]$ );
- At 10 exposures, the indirect effect was moderate (Effect =  $0.22$ , 95% CI =  $[0.12, 0.35]$ );
- At 20 exposures, the indirect effect was minimal and the confidence interval included zero (Effect =  $0.06$ , 95% CI =  $[-0.02, 0.15]$ ), indicating that the mediating mechanism effectively disappears under high-frequency exposure.



**Figure 11.** Conditional Indirect Effects Across Different Exposure Levels.

Sensitivity analysis showed that after removing extreme outliers in response time (top and bottom 2.5%), the interaction term and the Index of Moderated Mediation

remained robustly significant. These results provide clear evidence that, while cultural heritage design infusion can enhance brand evaluation through increased perceived cultural value, excessive repeated exposure on social media triggers aesthetic fatigue, constituting a strict boundary condition that impedes this value transfer mechanism (Figure 12–14).



**Figure 12.** Correlation Heatmap of Key Variables in Study 3.

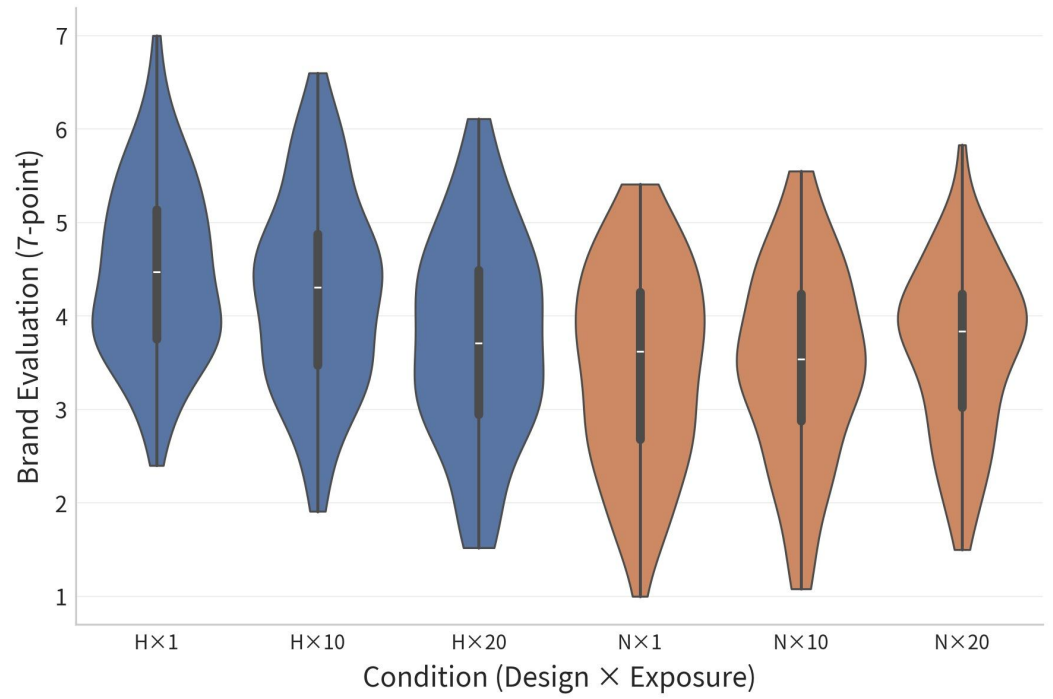


Figure 13. Violin Plots of Brand Evaluation Across Experimental Groups in Study 3.

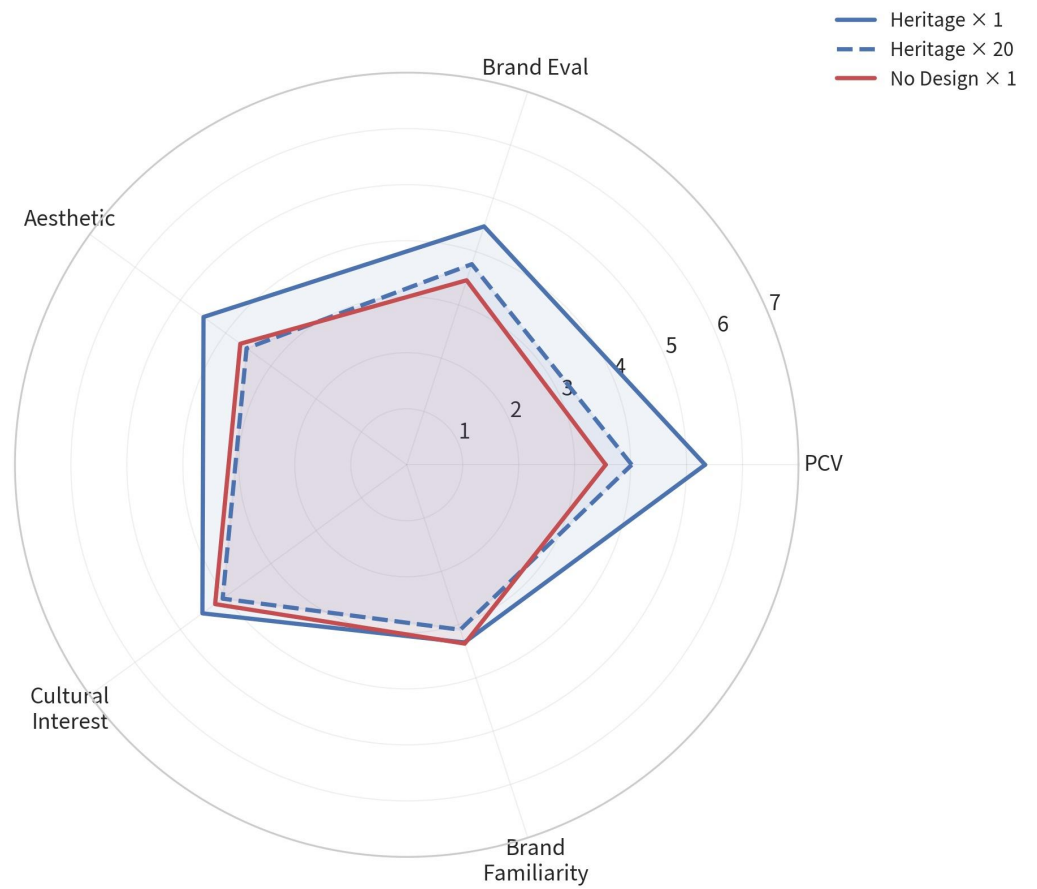
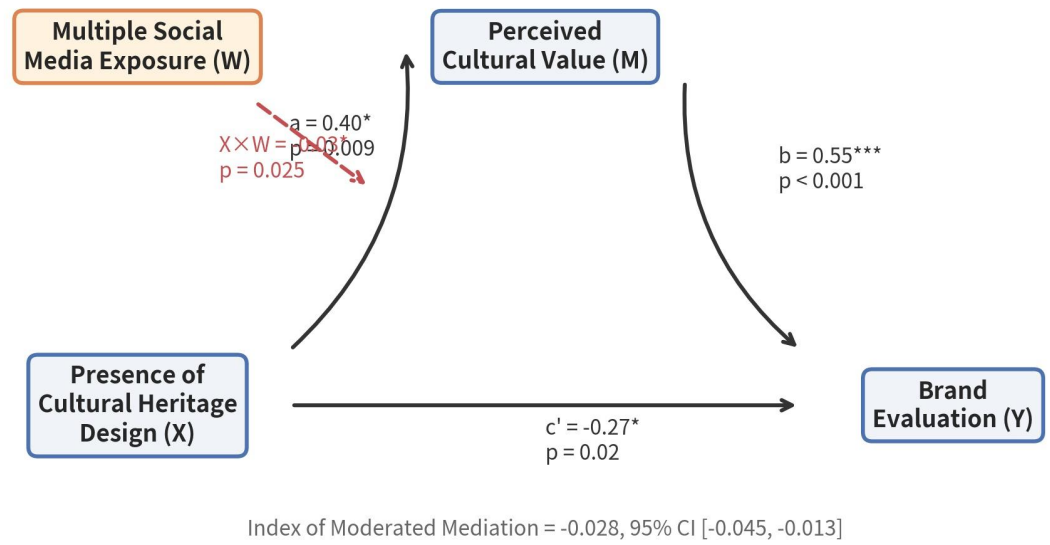


Figure 14. Comparison of Multidimensional Indicators Across Experimental Groups.



**Figure 15.** Path Diagram of the Moderated Mediation Model.

## 6. Discussion

### 6.1. Interpretation of Core Findings and Cross–Study Comparison

This study employed three progressive experiments to systematically examine the impact of cultural heritage design infusion (CHDI) on brand evaluation and its boundary conditions in a digital marketing context. The results confirmed the general effectiveness of design infusion. Consistent with Hagtvedt and Patrick (2008), who found that “art enhances perceived luxury independently of content,” our findings demonstrate that the infusion of cultural heritage elements can significantly increase consumers’ perceived cultural value independently of the product’s functional attributes. This extends the application scope of interdisciplinary design innovation theory, indicating that not only Western classical art but also Eastern cultural heritage with profound historical significance possesses strong premium potential.

However, unlike prior studies assuming a constant design effect (e.g., Gupta & Joshi, 2023), this study introduces a dynamic perspective. In traditional offline retail contexts, consumers’ exposure to culturally creative products is relatively low, and thus the positive effect of single exposure is amplified. In contrast, in contemporary social media environments, we observe a significant “diminishing marginal utility” of repeated exposure, indicating that high–frequency visual contact reduces the incremental benefit of design infusion.

### 6.2. Longitudinal Relationships and Internal Logic

From a longitudinal perspective, the results of this study form a coherent chain of evidence. Study 1 established the foundational “Design Infusion → Perceived Cultural Value → Brand Evaluation” pathway. Study 2 independently captured the declining trend of aesthetic ratings under high–frequency visual stimulation, demonstrating the

occurrence of aesthetic fatigue. Study 3 integrated the two, successfully validating the moderated mediation model.

This internal logic clearly shows that repeated exposure on social media does not directly reduce brand evaluation. Rather, it triggers cognitive and aesthetic fatigue, disrupting the mediating pathway through which cultural heritage design translates into perceived cultural value. When consumers experience visual saturation and psychological boredom, the original sacredness, scarcity, and historical depth embedded in cultural heritage are diminished, preventing it from continuing to serve as an effective cue for enhancing brand evaluation.

### *6.3. Attribution of Differences and In-Depth Analysis*

Why do some prior studies, such as early literature on the Mere Exposure Effect, report increased preference with repeated exposure, whereas our study finds a decline in evaluation? A deeper explanation lies in the complexity of the stimuli and cognitive load. Zajonc's (1968) classic experiments often employed simple, meaningless words or geometric shapes, whereas cultural heritage designs contain complex patterns, rich colors, and dense semantic information.

According to cognitive resource theory, processing such complex cultural visual information consumes more cognitive resources. When these high-information-density stimuli are presented frequently in a short period (e.g., scrolling short videos or social media feeds), consumers quickly surpass the "saturation point" of preference and enter the satiation phase.

Moreover, the core appeal of cultural heritage lies in its uniqueness and sense of distance. Overexposure on social media undermines this distance, turning culturally rich content into mundane visual fast food, leading to a sharp drop in perceived value.

## **7. Conclusion**

### *7.1. Core Findings*

From the perspective of interdisciplinary design innovation, this study yields the following key conclusions: cultural heritage design infusion (CHDI) can significantly enhance consumers' positive brand evaluation by increasing perceived cultural value. However, this mechanism is strictly constrained by the frequency of repeated exposure on social media. As exposure to homogeneous cultural design products increases, consumers experience pronounced aesthetic fatigue, weakening or even nullifying the mediating effect of perceived cultural value. In other words, in digital marketing contexts, CHDI exhibits a clear "diminishing marginal utility" boundary.

### *7.2. Theoretical and Practical Implications*

Theoretically, this study is among the first to integrate aesthetic fatigue theory with the design infusion model, extending the applicability of interdisciplinary theories to digital marketing contexts and providing a novel framework for understanding the attenuation of cultural symbols under information overload.

Practically, the findings offer important guidance for brands engaged in cross-sector collaborations. Firms conducting cultural heritage co-branding campaigns should abandon the notion of “more is better” and be cautious of the backfire effects of over-marketing. Marketers are encouraged to implement frequency capping strategies or to continuously iterate design styles and enrich cultural narrative dimensions to delay consumers’ aesthetic fatigue, thereby preserving the scarcity and appeal of cultural heritage.

### *7.3. Research Limitations*

This study has several limitations. First, scope limitations: the stimuli primarily focused on Chinese traditional cultural heritage (e.g., Cloisonné patterns) and specific products (tea sets). Future research should test the generalizability of the findings across broader cross-cultural contexts (e.g., Western intangible heritage) and diverse product categories (e.g., high-tech electronic products). Second, methodological limitations: although online experiments simulating social media feeds enhanced ecological validity, they cannot fully capture the complex psychological processes that occur on actual social media platforms, such as comments, likes, and other social cues.

### *7.4. Future Research Directions*

Future studies may consider the following directions:

- Examine whether different design innovation strategies (e.g., abstract extraction vs. concrete replication) can mitigate aesthetic fatigue induced by repeated exposure to varying degrees;
- Incorporate neurophysiological measures, such as EEG or eye-tracking, to more objectively capture consumers’ cognitive load and fatigue dynamics during repeated exposure;
- Investigate the moderating role of individual differences, such as cultural confidence and need for cognitive closure, in accelerating or alleviating aesthetic fatigue.

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