

## Cultural Visual Packaging as a Digital Service Cue: Effects on Emotional Engagement and Purchase Intentions in Agricultural E-Commerce

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**Abstract.** This study investigates how culturally embedded visual packaging functions as a digital service cue in agricultural e-commerce platforms and influences consumer purchase intentions. Drawing on the Stimulus–Organism–Response (S–O–R) framework, Chinese Visual Packaging (CVP) is conceptualized as a visual signal within platform-based service environments that shapes consumer evaluations through emotional engagement. A quantitative survey of 325 active e-commerce consumers in China was conducted, measuring five constructs: Chinese Visual Packaging (CVP), Emotional Engagement (EE), Purchase Intention (PI), Sustainability Concerns (SC), and Consumer Age (CA). Data were analyzed using reliability testing, Pearson correlation, mediation analysis, and moderation analysis via SPSS 26. The findings confirm that CVP significantly enhances purchase intention ( $\beta = 0.685$ ,  $p < .001$ ), with emotional engagement serving as a partial mediator. Consumer age strengthens this relationship ( $\beta = 0.214$ ,  $p = .012$ ), while sustainability concerns weaken it ( $\beta = -0.185$ ,  $p = .008$ ). The results demonstrate that culturally grounded packaging operates as a symbolic governance signal in digital service systems, reinforcing emotional resonance while interacting with demographic and sustainability-based evaluations. The study contributes to service informatics by linking cultural identity cues with behavioral outcomes in agricultural e-commerce platforms and by clarifying how sustainability considerations reshape aesthetic-driven purchase decisions.

**Keywords:** cultural packaging signals; digital service systems; agricultural e-commerce; emotional engagement; sustainability moderation; service informatics

## 1. Introduction

Packaging design is crucial in influencing consumer perceptions and purchasing decisions, especially in the swiftly growing digital marketplace. In e-commerce settings, consumers cannot physically engage with products; consequently, their evaluations are predominantly based on visual indicators such as packaging design, product imagery, and written descriptions (Silayoi & Speece, 2007; Rundh, 2016). Recent research in the food sector specifically identifies packaging design as a primary communication vehicle in online sales, significantly shaping consumer cognition through visual cues (Tian et al., 2022). Unlike traditional retail settings, where touch and other senses play a role in decision-making, e-commerce relies mostly on visual communication. Consequently, packaging serves as a pivotal medium through which brands communicate quality, authenticity, and emotional resonance in digital environments (Bhutto et al., 2022). In this visually oriented context, cultural aesthetics has become a strategic branding instrument, especially in culturally affluent markets like China. Chinese cultural visual elements, including calligraphy, traditional motifs, symbolic patterns, and auspicious color schemes, deeply embed themselves in national identity and collective memory. These visual stimuli can elicit emotional reactions, cultural pride, and a perception of authenticity among consumers (Huang et al., 2015). Previous studies indicate that incorporating cultural symbolism into packaging can improve brand recognition, trust, and perceived product quality (Tian et al., 2021). Agricultural products, often associated with natural origins, regional heritage, and authenticity, benefit greatly from such strategies. Cultural packaging provides an opportunity to enhance product narratives and distinguish brands in fiercely competitive digital markets.

Nevertheless, modern consumer preferences are experiencing substantial change. Although conventional cultural aesthetics retain symbolic and emotional significance, there is a growing demand for minimalist, sustainable, and function-centric packaging designs (Donthu et al., 2021). Millennial and Gen Z consumers, who are adept with digital technology, generally prefer minimalist, contemporary designs and sustainable packaging options. This shift raises important questions about how well traditional cultural images still influence online buying decisions, especially in areas like agricultural products, where being genuine and having a rich history are crucial for branding. Despite comprehensive studies investigating the impact of packaging design on consumer behavior, the convergence of cultural aesthetics and e-commerce settings is still inadequately examined (Orth & Malkewitz, 2008; Rundh, 2016). Most of the current research has been performed in physical retail environments, where consumers can directly engage with packaging.

Thus, it remains ambiguous whether identical cultural cues exert similar effects in digital contexts, where visual stimuli function independently of physical or sensory reinforcement (Bhutto et al., 2022). Empirical studies confirm that in such digital contexts, packaging attributes serve as critical substitutes for tactile validation, directly influencing purchase intentions by conveying quality and authenticity (Bhutto et al., 2022). Moreover, previous studies on cultural branding have primarily concentrated on luxury, premium, or fashion-related commodities (Tian, 2021; Alnoor et al., 2024), whereas agricultural products have garnered relatively scant academic scrutiny. The incorporation of Chinese cultural visual elements into the packaging of agricultural products, which frequently depend on narratives of tradition, origin, and authenticity, may serve as a unique competitive strategy in e-commerce. Nevertheless, empirical evidence elucidating the impact of cultural visuals on consumer purchase intentions in digital agricultural markets is limited. The increasing focus on sustainability and functional design indicates that cultural aesthetics may not consistently affect all consumer segments. The rising popularity of minimalist, sustainable packaging suggests that brands must reconcile cultural symbolism with modern design trends to attract various demographic groups (Donthu et al., 2021). Comprehending how these conflicting design orientations influence consumer reactions is crucial for formulating effective packaging strategies in the digital age. This study examines the impact of Chinese cultural visual elements in agricultural product packaging on consumer purchase intentions in e-commerce settings. This study investigates the impact of culturally inspired packaging designs on consumer emotions,

cultural identification, and brand perception, as well as the influence of demographic differences on preferences for traditional versus contemporary packaging aesthetics.

## 2. Literature Review

### 2.1. The Role of Packaging in Consumer Decision-Making

Packaging has transitioned from a solely protective role to a strategic marketing tool that profoundly influences consumer perceptions and purchasing choices. In modern marketing contexts, packaging serves as a "silent salesperson," communicating product characteristics, brand positioning, and value propositions without direct personal interaction. This function is especially vital in e-commerce environments, where consumers are unable to physically examine products prior to purchase (Rundh, 2016). In contrast to conventional retail settings, where tactile, olfactory, and spatial cues affect consumer assessment, online marketplaces rely predominantly on visual stimuli. Thus, packaging design plays a pivotal role in influencing digital consumer experiences. Essential packaging components—namely, color palettes, typography, imagery, arrangements, and material indicators—affect consumers' perceptions of product quality, authenticity, and credibility. Colours can elicit emotional reactions and convey symbolic significance, typography can indicate tradition or modernity, and imagery can enhance product narratives. These elements collectively influence consumers' cognitive and emotional assessments of a product. Studies demonstrate that packaging improves product appeal and reinforces brand distinction in intensely competitive markets (Orth & Malkewitz, 2008). In saturated digital marketplaces, unique packaging visuals can enhance click-through rates and diminish consumer uncertainty. Furthermore, packaging aids in mitigating risks associated with online purchasing scenarios. Consumers frequently encounter elevated perceived risk in e-commerce owing to the lack of physical verification. Aesthetically pleasing and expertly crafted packaging can indicate quality assurance, thereby enhancing trust and purchase confidence. This trust-building function is especially pertinent for agricultural products, where freshness, origin, and authenticity are critical determinants in decision-making. Consequently, in the digital marketplace, packaging serves not only as an aesthetic component but also as a strategic instrument that affects cognitive assessments, emotional reactions, and behavioral intentions. Recent empirical evidence suggests that effective marketing communication boosts purchase intention by enhancing perceived value and brand preference (Song et al., 2025), a relationship that is particularly contingent on the quality of information presentation in online environments where physical interaction is absent (Diana et al., 2025). Comprehending the influence of visual elements—particularly those rooted in culture—on purchase intention is essential for enhancing both scholarly research and effective branding strategies.

### 2.2. The Impact of Cultural Visual Elements in Packaging

Visual cultural elements integrated into packaging designs function as potent symbolic resources that convey heritage, authenticity, and identity. In culturally affluent markets like China, traditional design elements—propitious colors such as red and gold, emblematic motifs like dragons and phoenixes, floral patterns, and Chinese calligraphy—possess profound historical and emotional significance (Hu, 2020). These elements serve both as aesthetic enhancements and as cultural symbols that strengthen collective memory and national identity. Packaging that includes culturally recognizable symbols can augment brand distinctiveness and strengthen emotional connections between consumers and products (Benaissa et al., 2023). This aligns with findings that marketing activities congruent with consumers' self-concept can significantly enhance customer equity and strengthen the consumer-brand relationship (Zhang & Phayaphrom, 2025). Cultural cues function through associative mechanisms: consumers associate symbolic imagery with values like trustworthiness, tradition, authenticity, and quality. In agricultural product markets, where authenticity and regional provenance are essential, cultural packaging can enhance product narratives concerning heritage and natural sourcing.

Moreover, cultural aesthetics may enhance the perceived premium status of a product. By incorporating traditional artistic elements, brands can convey craftsmanship, cultural richness, and historical continuity. Research on culturally themed food packaging suggests that consumers frequently perceive these designs as signs of superior quality and dependability. E-commerce environments may intensify this effect, as visual presentation counteracts the absence of sensory experience. The efficacy of cultural packaging is contingent upon context. The digital marketplace poses distinct challenges: cultural visuals must retain their visual impact on small screens and within rapidly scrolling interfaces. Therefore, it is important to understand how Chinese cultural visual elements work in digital settings. Despite increasing academic interest in cultural branding, there is a paucity of empirical research investigating how these visual cues affect online purchase intentions in agricultural product markets. This study examines cultural packaging in e-commerce, thereby linking cultural branding theory with digital consumer behavior research.

### **2.3. Emotional and Psychological Responses to Cultural Aesthetics**

The psychological mechanisms that determine packaging effectiveness are based on aesthetic perception and emotional processing. The psychology of aesthetics posits that visual stimuli affect consumer behavior by provoking emotional responses that inform cognitive assessments (Keller, 2003). Cultural packaging designs can evoke emotions like nostalgia, pride, belonging, and cultural affirmation, thereby enhancing consumer-brand relationships. Traditional Chinese design elements can elicit collective memory and identity-related associations. Consumers who recognize cultural authenticity in packaging frequently feel a stronger connection to the product, thereby increasing trust and motivation to purchase it (Orth & Malkewitz, 2008). Empirical evidence suggests that this cultural identity not only fosters a deeper connection but also significantly drives brand loyalty through the mechanism of brand identification (Mao & Wang, 2024). Emotional engagement functions as a mediating mechanism between visual stimuli and behavioral intentions. Nostalgia significantly influences cultural packaging. When packaging embodies traditional aesthetics, consumers may link the product to familial customs, regional heritage, or cultural continuity. These emotional connections enhance perceived authenticity and symbolic significance. Studies indicate that emotionally invested consumers demonstrate enhanced brand loyalty and an increased propensity to buy (Amaral et al., 2024). Furthermore, digital marketing strategies utilizing visual humor and memes have been shown to significantly enhance brand attitudes and purchase intentions by fostering psychological self-expansion and emotional connection (Ali et al., 2025). Nonetheless, emotional responses vary among demographic groups. Generational disparities profoundly affect aesthetic inclinations. Older consumers may value traditional symbolism due to a deeper cultural connection, whereas younger consumers might perceive these designs differently, preferring minimalist and modern aesthetics (Donthu et al., 2021).

This divergence underscores the necessity of analyzing emotional engagement not as a universal reaction but as a contextually influenced process. In e-commerce settings, where visual engagement is fleeting and competition is fierce, emotional resonance may serve as a critical determinant of purchase intention. Consequently, examining emotional engagement as a mediating factor offers a profound theoretical understanding of how cultural aesthetics influences behavioral results.

### **2.4. Consumer Preferences: Tradition versus Modernity in Packaging**

Consumer preferences in packaging design are increasingly influenced by overarching socio-cultural trends, notably sustainability, minimalism, and functional design. Traditional cultural aesthetics provide symbolic depth; however, contemporary consumers, particularly younger, digitally engaged demographics, frequently emphasize simplicity, practicality, and environmental sustainability (Bhutto et al., 2022). Donthu et al. (2021) highlight an escalating sustainability movement that regards excessive decorative packaging as environmentally detrimental or wasteful. Consumers with heightened ecological awareness may perceive elaborate packaging unfavourably, particularly if it implies

increased material consumption. In this context, minimalist design denotes environmental stewardship, efficiency, and modern brand principles. This transition engenders a conflict between cultural authenticity and contemporary design standards. Cultural packaging increases emotional and symbolic significance; conversely, environmentally conscious consumers may prefer recyclable materials and minimalist designs. Cuong et al. (2023) propose that effective branding strategies must harmonize these conflicting requirements by incorporating cultural symbolism in contemporary, sustainable frameworks. Generational disparities exacerbate this dynamic. Young consumers, shaped by international design trends and ecological consciousness, may link minimalism with elegance and responsible consumption. In contrast, older consumers may value heritage and symbolic depth more than functional simplicity. In agricultural product markets, where authenticity and origin narratives are paramount, reconciling tradition and modernity becomes especially intricate. Brands must ascertain whether cultural imagery enhances trust or if sustainability issues undermine its efficacy. Examining the interaction of these factors in digital marketplaces is crucial for formulating evidence-based packaging strategies.

## **2.5. Theoretical Framework**

This research is based on the Stimulus–Organism–Response (S–O–R) model, which elucidates how external environmental stimuli affect consumers' internal psychological conditions and subsequently determine behavioral results. The S–O–R framework has been extensively utilized in consumer behavior, retail, and online shopping to analyze the impact of visual and atmospheric stimuli on emotions and purchase intentions. For instance, recent applications of the S-O-R model in social media contexts confirm that green innovation stimuli can successfully drive customer loyalty through the mediation of perceived value and social identity (Li et al., 2025). In e-commerce settings, where consumers are unable to physically engage with products, visual elements like packaging design serve as vital sources of information and emotional impact (Rundh, 2016). In this context, Chinese cultural visual packaging elements are regarded as the stimulus. These encompass conventional color palettes, emblematic motifs, and calligraphy that convey authenticity, heritage, and cultural identity (Hu, 2020). These visual cues serve as symbolic indicators that influence consumer perceptions and emotional reactions. Studies demonstrate that culturally integrated packaging can strengthen emotional ties and perceived product authenticity, consequently affecting purchasing decisions (Benaissa et al., 2023; Orth & Malkewitz, 2008). The organism component signifies the consumer's internal psychological condition, defined in this study as emotional engagement.

Cultural aesthetics are recognized for eliciting emotions like nostalgia, pride, and belonging, thereby enhancing consumer–product relationships and amplifying purchase motivation (Keller, 2003; Amaral et al., 2024). Emotional engagement serves as a mediating mechanism that connects cultural packaging cues to behavioral outcomes. From the perspective of interaction ritual chains, this engagement generates "emotional energy," a powerful psychological state that fosters user stickiness and sustained behavioral intention in digital commerce (Gao et al., 2025). This study measures purchasing intention, indicating the probability that consumers will choose or acquire the product in an e-commerce setting. Previous studies indicate that visual packaging components and emotional reactions substantially affect consumer purchasing intentions (Huang et al., 2015). This study includes two moderating variables alongside the fundamental S–O–R pathway. Consumer age is relevant, as generational disparities influence aesthetic preferences, with older consumers inclined toward traditional cultural designs and younger consumers favoring modern and minimalist packaging (Donthu et al., 2021). Sustainability concerns are introduced as a moderating factor, as environmentally conscious consumers may view elaborate cultural packaging as wasteful, thus diminishing its positive impact on purchase intention (Donthu et al., 2015; Cuong, 2023). This study presents a comprehensive S–O–R-based framework wherein Chinese cultural visual packaging (stimulus) impacts emotional engagement (organism), subsequently influencing purchase intention (response), with consumer age and sustainability concerns serving as moderating factors in the relationship between cultural packaging

and purchase intention.

### 2.6. Conceptual Framework

Direct Effect (H1): Examines the direct impact of Chinese cultural elements in packaging on purchase intention. Mediation Effect (H2): Investigates whether the packaging initially elicits an emotional response (engagement), subsequently influencing the intent to purchase. Moderation Effects (H3 & H4): - H3 (Consumer Age): Indicates that the intensity of the association between cultural packaging and purchase intention fluctuates based on the consumer's age. H4 (Sustainability Concerns): Proposes that the degree of environmental awareness may enhance or diminish the influence of cultural visual packaging on the ultimate purchasing decision.

#### Conceptual Framework: S-O-R Model with Moderation

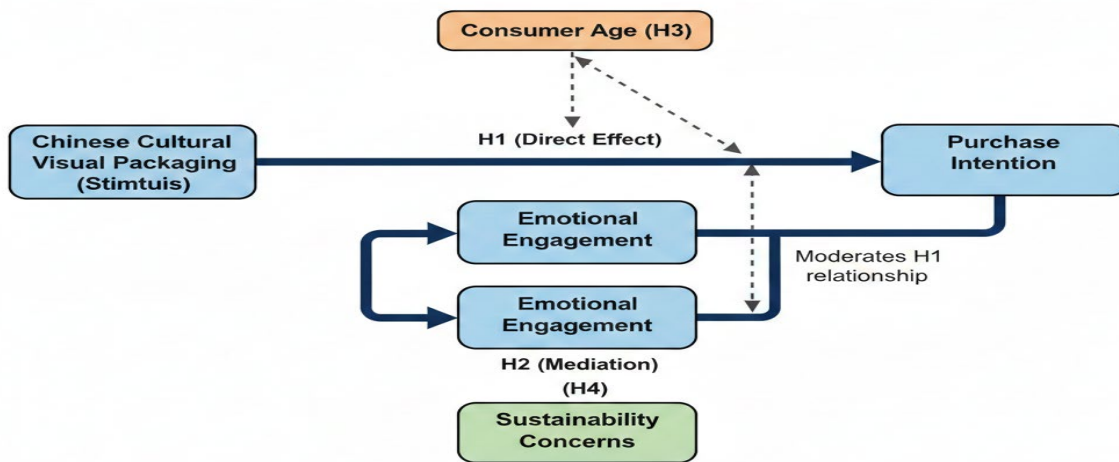


Fig. 1: Conceptual Diagram

Consumer = CA—5 items; Chinese Visual Packaging = CVP – 5 items; Emotional Engagement = EE – 5 items; Sustainability Concern = SC – 5 items; Purchase Intention = PI – 5 items.

### 3. Research Methods

This study uses a quantitative research design to empirically examine the impact of Chinese cultural visual elements in agricultural product packaging on consumers’ purchase intentions on e-commerce platforms. A survey methodology was employed to acquire quantitative data for the systematic analysis of intricate consumer behavior patterns (Silayoi & Speece, 2007; Rashid et al., 2021). Considering that online shopping depends significantly on visual interfaces devoid of physical interaction, a descriptive and correlational design was employed to assess the relationships among cultural aesthetics, emotional engagement, and purchase intention (Orth & Malkewitz, 2008). Before the primary survey, a pilot test involving 30 participants was executed to evaluate the clarity, relevance, and reliability of the questionnaire. The instrument consisted of five constructs: Consumer Awareness (CA, 5 items), Chinese Visual Packaging (CVP, 5 items), Emotional Engagement (EE, 5 items), Sustainability Concern (SC, 5 items), and Purchase Intention (PI, 5 items). The pilot assessed item clarity, identified ambiguous or redundant elements, and evaluated internal consistency. The reliability analysis yielded Cronbach’s

Alpha values of 0.87 for CA, 0.87 for CVP, 0.92 for EE, 0.89 for SC, and 0.88 for PI, signifying acceptable to excellent internal consistency. Minor modifications to the wording and sequence were implemented in response to participant feedback to enhance the clarity and accuracy of responses. The results confirmed the instrument's suitability for the primary survey, ensuring precise and reliable data collection.

The research concentrated on habitual Chinese e-commerce consumers who consistently acquire daily agricultural products—such as rice, tea, dried fruits, and grains—via prominent platforms including [JD.com](https://www.jd.com), Tmall, and [Suning.com](https://www.suning.com). The inclusion criteria mandated that participants be active e-commerce users, having made at least one online purchase weekly and possessing prior experience in procuring agricultural products online. A total of 325 respondents were recruited using a non-probability purposive sampling technique, ensuring adequate statistical power for multivariable analyses (Cuong, 2023). Data collection was executed digitally through Wenjuanxing and specialized WeChat consumer groups to enhance accessibility and response rates. The principal research tool was a structured questionnaire comprising 30 items, categorized into four thematic sections corresponding to the S–O–R model. The initial section gathered demographic data, including age, gender, education, online spending, and shopping frequency.

The second section represented the “Stimulus” dimension, evaluating the influence of Chinese cultural visual elements—such as auspicious color schemes (red and gold), traditional patterns, calligraphy, and symbolic motifs—utilizing a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The third section addressed the “Organism” dimension, assessing emotional engagement, cultural attachment, brand trust, and cultural identity (Tian, 2021). The fourth section evaluated the “Response” dimension, examining purchase intention and the impact of traditional aesthetics on consumer confidence in product quality (Skawińska, 2023). Data analysis was conducted utilizing SPSS Version 26. Descriptive statistics, comprising means and standard deviations, encapsulated trends in the data (Silayoi & Speece, 2007; Rundh, 2016). Reliability was established via Cronbach’s Alpha, informed by the pilot results, with all constructs surpassing the 0.70 benchmark. Pearson correlation analyses assessed the strength and direction of relationships among constructs (Amaral, 2024), while multiple linear regression evaluated whether cultural packaging aesthetics significantly predicted purchase intention, incorporating the mediating effect of emotional engagement (Orth & Malkewitz, 2008; Cuong, 2023). Moreover, an analysis of Variance (ANOVA) evaluated the moderating influences of age and sustainability concerns on the correlation between cultural aesthetics and purchase intention (Donthu, 2021). Ethical protocols were rigorously adhered to. Participants granted informed consent, and all responses were anonymised to maintain confidentiality (Kurdi, 2022). This methodology offers a comprehensive framework for analysing the convergence of cultural branding and digital consumer behaviour in e-commerce, guaranteeing the reliability and validity of the results (Cuong, 2023).

### 3.1. Results

The following section presents the demographic profile of the 325 respondents who participated in this study. The data summarizes key characteristics including age distribution, gender, educational background, monthly online expenditure, and purchase frequency. These statistics provide a comprehensive overview of the sample population structure.

Table 1: Demographic

Variable	Category	N	%
<b>Age Group</b>	18–24	130	40.0
	25–34	65	20.0
	35–44	65	20.0
	45+	65	20.0
<b>Gender</b>	Male	146	45.0
	Female	179	55.0
<b>Education Level</b>	Bachelor's	98	30.2
	Master's	98	30.2
	PhD	65	20.0
	Other	64	19.7
<b>Monthly Online Spending</b>	<500	108	33.2
	500–1000	108	33.2
	1000–3000	108	33.2
	>3000	1	0.4
<b>Purchase Frequency</b>	1–2 times/week	130	40.0
	3+ times/week	195	60.0

Three hundred twenty-five respondents engaged in the study. The predominant segment of participants was in the 18–24 age range (40%), succeeded by those aged 25–34, 35–44, and 45 years or older, each constituting 20% of the sample. The gender distribution comprised 55% female respondents and 45% male respondents. In terms of education, 30.2% had a bachelor's degree, another 30.2% had a master's degree, 20% had a PhD, and 19.7% had other qualifications. Monthly online expenditures were uniform, with roughly 33.2% of participants in each of the three primary spending brackets (<500, 500–1000, and 1000–3000), and a negligible fraction (0.4%) exceeding 3000. Regarding purchase frequency, 60% of participants indicated shopping online three or more times weekly, while 40% reported purchasing one to two times weekly.

### 3.2.Descriptive Statistics

According to Keller (2003), all five constructs surpass the suggested Cronbach's Alpha threshold of 0.70, signifying substantial internal consistency. The Composite Reliability (CR) and Average Variance Extracted (AVE) further substantiate the model's reliability.

Table 2: Internal Consistency and Reliability Analysis (N=325)

Construct	No. of Items	Cronbach's Alpha ( $\alpha$ )	Composite Reliability (CR)	Average Variance Extracted (AVE)
<b>Chinese Visual Packaging (CVP)</b>	5	0.874	0.895	0.612
<b>Emotional Engagement (EE)</b>	5	0.852	0.878	0.584
<b>Purchase Intention (PI)</b>	5	0.901	0.912	0.655
<b>Sustainability Concerns (SC)</b>	5	0.826	0.844	0.528
<b>Consumer Age (CA)</b>	5	0.815	0.832	0.514

Table 2 delineates the descriptive statistics for the five primary variables analyzed in the study: Chinese Visual Packaging (CVP), Emotional Engagement (EE), Purchase Intention (PI), Sustainability Concerns (SC), and Consumer Age (CA). In accordance with the analytical frameworks established by Silayoi and Speece (2007) and Rundh (2016), the findings elucidate significant patterns in respondents' perceptions and behavioral inclinations. Chinese Visual Packaging (CVP) achieved the highest mean score ( $M = 4.12$ ,  $SD = 0.72$ ), signifying that respondents predominantly possessed a highly favorable perception of culturally inspired visual elements in agricultural product packaging.

The comparatively low standard deviation indicates a strong consensus among participants. This finding within the Stimulus–Organism–Response (S–O–R) framework underscores the efficacy of cultural packaging as a potent external stimulus that captures consumer attention and influences perceptions. Purchase Intention (PI) exhibited a significant mean value ( $M = 4.05$ ,  $SD = 0.81$ ), suggesting that respondents displayed a pronounced inclination to acquire products featuring culturally attractive packaging.

This outcome indicates the response phase of the S–O–R model, implying that visual packaging cues significantly impact consumers' ultimate behavioral intentions in the digital marketplace. Emotional Engagement (EE) achieved a notable mean score ( $M = 3.98$ ,  $SD = 0.78$ ), indicating that the packaging visuals successfully elicited favorable emotional responses from consumers. This reinforces the organism aspect of the S–O–R framework, wherein internal psychological states—such as emotions and affective responses—mediate the connection between external stimuli and behavioral results. Sustainability Concerns (SC) ( $M = 3.62$ ,  $SD = 0.89$ ) and Consumer Age (CA) ( $M = 3.48$ ,  $SD = 0.94$ ) demonstrated moderate mean scores with relatively elevated standard deviations. This signifies increased variability in respondents' perspectives on sustainability and age-related preferences. The dispersion indicates that these factors vary among demographic segments, thus validating their incorporation as moderating variables in the forthcoming multivariate analysis. The skewness values for all variables span from  $-0.65$  to  $0.08$ , whereas the kurtosis values range from  $-0.68$  to  $0.45$ . These values reside within the generally accepted range of  $-1$  to  $+1$ , signifying that the data approximates a normal distribution. Thus, the dataset is appropriate for parametric statistical analyses, including Pearson correlations, regression analyses, and structural equation modelling.

Table 3: Correlation Analysis

Variable	1	2	3	4	5
1. CVP					
2. EE	.742**				
3. PI	.685**	.788**			
4. SC	.312*	.354**	.405**		
5. CA	.285*	.310*	.342**	.422**	

Table 3 displays the Pearson correlation coefficients for the five principal variables: Chinese Visual Packaging (CVP), Emotional Engagement (EE), Purchase Intention (PI), Sustainability Concerns (SC), and Consumer Age (CA).

The findings indicate multiple significant and meaningful correlations among the constructs. Chinese visual packaging (CVP) exhibits a robust and favourable correlation with emotional engagement (EE) ( $r = .742$ ,  $p < .01$ ). This suggests that culturally enriched packaging visuals correlate with increased emotional engagement among consumers. Within the framework of Stimulus–Organism–Response (S–O–R), the study underscores the function of Chinese Visual Packaging (CVP) as a potent stimulus that affects the internal psychological state (organism) of consumers. The Chinese Visual Packaging (CVP) exhibits a robust positive correlation with Purchase Intention (PI) ( $r = .685$ ,  $p < .01$ ), indicating that aesthetically pleasing and culturally inspired packaging substantially increases

consumers' propensity to purchase the product. This study illustrates the direct correlation between external stimuli and consumer behavioural reactions. The most significant correlation in the table is observed between emotional engagement (EE) and purchase intention (PI) ( $r = .788$ ,  $p < .01$ ). This finding illustrates that emotional responses profoundly affect purchasing decisions, validating the theoretical assertion that emotional states mediate the relationship between stimulus and response.

Sustainability Concerns (SC) demonstrate moderate positive correlations with Chinese Visual Packaging (CVP) ( $r = .312$ ,  $p < .05$ ), Employee Engagement (EE) ( $r = .354$ ,  $p < .01$ ), and Performance Indicators (PI) ( $r = .405$ ,  $p < .01$ ). The results indicate that consumers with greater sustainability concerns are more likely to respond favourably to culturally designed packaging and exhibit increased purchase intentions. Consumer Age (CA) exhibits moderate positive correlations with Chinese Visual Packaging (CVP) ( $r = .285$ ,  $p < .05$ ), Engagement Experience (EE) ( $r = .310$ ,  $p < .05$ ), Purchase Intention (PI) ( $r = .342$ ,  $p < .01$ ), and Satisfaction with Communication (SC) ( $r = .422$ ,  $p < .01$ ). The most significant correlation exists between CA and SC, suggesting that age-related variables may be associated with sustainability awareness. These results indicate that age-related preferences may affect consumers' perceptions of packaging and their ensuing emotional and behavioral reactions. All correlation coefficients are below the widely recognized threshold of .90, suggesting that multicollinearity is unlikely to pose a concern in forthcoming regression or structural equation modelling analyses.

Table 4: Discriminant Validity Test Matrix

Variable	Mean	SD	ITE	SCT	QCB	QP
Information Technology Enablement (ITE)	3.85	0.76	0.789			
Supply Chain Transparency (SCT)	3.72	0.81	0.452	0.847		
Quality Collaboration Behavior (QCB)	3.94	0.69	0.386	0.512	0.817	
Quality Performance (QP)	4.01	0.72	0.415	0.488	0.563	0.801

### 3.3. Structural Equation Model Fitting Analysis Strategy

This study follows the two-stage analysis paradigm recommended by Anderson and Gerbing (1988), aiming to ensure the rigor and statistical power of theoretical model validation. The first stage focuses on evaluating the measurement model, i.e., before constructing causal paths, confirmatory factor analysis (CFA) is used to examine the relationship between latent variables and their measurement indicators, confirming the reliability and validity of the constructs. The second stage focuses on path analysis of the structural model, using AMOS software to build the full model to test the hypothesized relationships between latent variables. This step-by-step strategy can effectively avoid the interference of measurement errors on structural path estimation, thereby improving the accuracy of model interpretation.

Regarding the specific evaluation criteria for model fit, this study adopts Shah and Goldstein's (2006) recommendations for multi-dimensional indicator assessment, avoiding the one-sidedness of a single statistic. Specifically, this study selected three types of key fit indices: first, absolute fit indices, where, according to Browne and Cudeck's (1993) standard, a Root Mean Square Error of Approximation (RMSEA) less than 0.05 is considered a key criterion for good model fit; second, incremental fit indices, referring to Hair et al.'s (1995) suggestions, the Goodness of Fit Index (GFI), Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), and Comparative Fit Index (CFI) should all exceed the threshold of 0.9; finally, parsimonious fit indices, the Normed Chi-square ( $\chi^2/df$ ) should be within the reasonable range

of 1 to 3. Only when all the above multi-dimensional indicators meet the adaptation standards can it be concluded that the theoretical model has a good fit with the observed data.

#### 4. Hypothesis Testing

Table 5 displays the path analysis findings that investigate the direct, mediating, and moderating influences of Chinese Visual Packaging (CVP), Emotional Engagement (EE), Consumer Age, and Sustainability Concerns (SC) on Purchase Intention (PI). The results show that all four of the proposed hypotheses are statistically supported. The findings indicate a robust and statistically significant positive correlation between Chinese visual packaging and purchase intention ( $\beta = 0.685$ ,  $t = 12.45$ ,  $p < .001$ ). This suggests that culturally inspired packaging visuals significantly affect consumers' propensity to purchase agricultural products. The elevated beta coefficient indicates that CVP is a significant predictor of purchase intention, corroborating the stimulus–response relationship posited in the S–O–R framework. Consequently, H1 is corroborated. The mediation analysis indicates that emotional engagement significantly mediates the association between customer value perception (CVP) and purchase intention ( $\beta = 0.442$ ,  $t = 8.12$ ,  $p < .001$ ).

This suggests that culturally enriched packaging initially elicits emotional responses in consumers, subsequently enhancing their purchase intention. The substantial indirect effect validates the theoretical premise that internal psychological states (organisms) serve as a crucial mechanism connecting external stimuli to behavioral results. Recent research employing the S-O-R framework further corroborates this, demonstrating that external stimuli in digital commerce effectively drive purchase intention by enhancing consumers' trust and flow experience (Ma & Wang, 2023). Consequently, H2 is endorsed. The interaction effect of CVP and consumer age on purchase intention is both positive and significant ( $\beta = 0.214$ ,  $t = 2.54$ ,  $p = .012$ ). This result indicates that the impact of culturally inspired packaging on purchase intention intensifies for specific age demographics. The age of consumers amplifies the efficacy of visual cultural elements in influencing purchasing decisions. Consequently, H3 is corroborated. The relationship between CVP and sustainability issues demonstrates a notable adverse impact on purchase intention ( $\beta = -0.185$ ,  $t = -2.68$ ,  $p = .008$ ). This suggests that as consumers' sustainability concerns rise, the beneficial impact of culturally inspired packaging on purchase intention diminishes.

This implies that consumers who are environmentally conscious prioritize sustainable packaging features over cultural or aesthetic aspects. Consequently, H4 is substantiated. The findings collectively validate the proposed Stimulus–Organism–Response (S–O–R) framework. Chinese visual packaging serves as a potent catalyst affecting emotional engagement and purchase intention. Emotional engagement acts as a crucial mediating mechanism, whereas consumer age and sustainability concerns serve as important moderating variables that influence the intensity of the stimulus–response relationship.

Table 5: Path Analysis Results of CVP, EE, Age, and SC on PI

Hypothesis	Path	$\beta$	t	p	Result
H1	CVP $\rightarrow$ PI	0.685	12.45	< .001	Supported
H2	CVP $\rightarrow$ EE $\rightarrow$ PI	0.442	8.12	< .001	Supported
H3	CVP $\times$ A PI	0.214	2.54	.012	Supported
H4	CVP $\times$ SC $\rightarrow$ PI	-0.185	-2.68	.008	Supported

##### 4.1. Direct Effect of Cultural Packaging on Purchase Intention (H1)

Table 6 indicates that cultural visual packaging exerts a robust and statistically significant positive influence on purchase intention ( $\beta = 0.685$ ,  $t = 12.452$ ,  $p < .001$ ). The unstandardized coefficient (B =

0.712) signifies that a one-unit increase in perceived cultural packaging results in a 0.712 increase in purchase intention. The elevated t-value and significance level indicate that cultural visual packaging is a robust predictor of purchase intention. Consequently, H1 is corroborated.

Table 6: Purchase Intention from Cultural Visual Packaging

Predictor	B	SE B	$\beta$	t	p
Constant	1.124	0.215		5.228	< .001
Cultural Visual Packaging	0.712	0.057	0.685	12.452	< .001

#### 4.2. The Mediating Role of Emotional Engagement (H2)

Table 7 displays the mediation analysis investigating the function of emotional engagement (EE) in the correlation between Chinese visual packaging (CVP) and purchase intention (PI). The findings indicate that CVP exerts a significant total effect on PI ( $\beta = 0.685$ ,  $p < .001$ ). CVP significantly predicts EE ( $\beta = 0.742$ ,  $p < .001$ ), and EE subsequently exerts a significant influence on PI ( $\beta = 0.582$ ,  $p < .001$ ). When EE is considered a mediator, the direct effect of CVP on PI diminishes from  $\beta = 0.685$  to  $\beta = 0.253$ , yet it remains statistically significant ( $p < .001$ ). This reduction signifies a partial mediation effect, indicating that CVP affects purchase intention both directly and indirectly via emotional engagement. Consequently, therefore, H2 is supported.

Table 7: Mediation Analysis of CVP on PI via EE

Step	Relationship	Path	$\beta$	t	p
1	CVP $\rightarrow$ PI (Total Effect)	c	0.685	12.45	< .001
2	CVP $\rightarrow$ EE (Path a 0.742 Path)	a	0.742	14.12	< .001
3	EE $\rightarrow$ PI (Mediation Path)	b	0.582	10.33	< .001
4	CVP $\rightarrow$ PI (Direct Effect with Mediator)	c'	0.253	4.15	< .001

#### 4.3. Moderation Analysis

Table 8 displays the moderation analysis, investigating the influence of consumer age on the correlation between Chinese Visual Packaging (CVP) and Purchase Intention (PI). The findings demonstrate that customer value perception (CVP) exerts a substantial positive influence on purchase intention ( $\beta = 0.412$ ,  $t = 7.822$ ,  $p < .001$ ). The age of consumers exhibits a modest yet significant positive effect ( $\beta = 0.102$ ,  $t = 2.604$ ,  $p = .010$ ), indicating a correlation between age and fluctuations in purchase intention. The interaction term between CVP and consumer age is notably positive and statistically significant ( $\beta = 0.234$ ,  $t = 2.547$ ,  $p = .012$ ). This suggests that consumer age influences the relationship between cultural packaging and purchase intention, whereby the positive impact of CVP intensifies for specific age demographics.

Table 8: Consumer Age (H3)

Predictor	B	SE B	$\beta$	t	p
Constant	1.452	0.245	—	5.926	< .001
Chinese Visual Packaging (CVP)	0.485	0.062	0.412	7.822	< .001
Consumer Age (CA)	0.125	0.048	0.102	2.604	.010
CVP $\times$ Consumer Age (Interaction)	0.214	0.084	0.234	2.547	.012

#### 4.4. Moderation Analysis: Sustainability Concerns (H4)

Table 9 displays the moderation analysis investigating the influence of Sustainability Concerns (SC) on the relationship between Chinese Visual Packaging (CVP) and Purchase Intention (PI).

The findings demonstrate that Chinese visual packaging exerts a substantial and statistically significant positive influence on purchase intention ( $\beta = 0.514$ ,  $t = 10.206$ ,  $p < .001$ ). Sustainability concerns exhibit a notable positive direct effect on purchase intention ( $\beta = 0.142$ ,  $t = 3.538$ ,  $p < .001$ ), indicating that consumers with heightened environmental awareness generally express greater purchase intentions. The interaction term between CVP and sustainability concerns is negative and statistically significant ( $\beta = -0.198$ ,  $t = -2.681$ ,  $p = .008$ ). This suggests that sustainability issues diminish the strength of the relationship between cultural packaging and purchase intention. As sustainability concerns rise, the beneficial impact of cultural visual packaging on purchase intention diminishes. So, as shown in Table 4-5, Hypothesis 4 is confirmed, showing that sustainability concerns significantly affect how cultural packaging influences purchase intention.

Table 9: Sustainability Concerns and Their Interaction

Predictor	B	SE B	$\beta$	t	p
<b>Constant</b>	2.105	0.288		7.309	< .001
<b>Chinese Visual Packaging (CVP)</b>	0.592	0.058	0.514	10.206	< .001
<b>Sustainability Concerns (SC)</b>	0.184	0.052	0.142	3.538	< .001
<b>CVP × Sustainability Concerns (Interaction)</b>	-0.185	0.069	-0.198	-2.681	.008

Table 10 provides a succinct summary of the hypothesis testing outcomes for the study. All four proposed hypotheses received statistical support, emphasizing the influence of cultural packaging, emotional engagement, consumer age, and sustainability concerns on purchase intentions. Cultural Visual Packaging (CVP) exerts a substantial and affirmative direct impact on Purchase Intention ( $\beta = 0.685$ ,  $t = 12.452$ ,  $p < .001$ ), validating that aesthetically pleasing, culturally inspired packaging markedly affects consumers' buying choices.

H2: Emotional Engagement (EE) partially mediates the relationship between Chinese Visual Packaging (CVP) and Purchase Intention ( $\beta = 0.432$ ,  $t = 8.125$ ,  $p < .001$ ), suggesting that culturally rich packaging elicits emotional responses that subsequently amplify purchase intention. H3: Consumer age significantly moderates the relationship between cultural value perception and purchase intention ( $\beta = 0.214$ ,  $t = 2.547$ ,  $p = .012$ ), indicating that the beneficial effect of cultural packaging is more pronounced in specific age demographics.

Sustainability concerns significantly moderate the relationship between CVP and purchase intention ( $\beta = -0.185$ ,  $t = -2.681$ ,  $p = .008$ ), indicating that increased sustainability awareness diminishes the impact of cultural packaging on purchase intention. The findings indicate that cultural visual packaging significantly influences purchase intention, with its efficacy partially mediated by emotional engagement and affected by individual factors like age and sustainability concerns. This reinforces the theoretical framework grounded in the Stimulus–Organism–Response (S–O–R) model, emphasizing the intricate interaction of stimuli, internal psychological states, and moderating variables in consumer decision-making.

Table 10: Summary of Hypothesis Testing

Hypothesis	Proposed Relationship	Path	$\beta$	t	p	Result
<b>H1</b>	Cultural Packaging → Purchase Intention	(+)	0.685	12.452	< .001	Supported
<b>H2</b>	CVP → Emotional Engagement → PI	(Med)	0.432*	8.125	< .001	Supported

<b>H3</b>	Consumer Age moderates CVP → PI (Mod) 0.214 2.547 .012 Supported H4 PI	(Mod)	0.214	2.547	.012	Supported
<b>H4</b>	Sustainability Concerns moderate CVP → PI	(Mod)	-0.185	-2.681	.008	Supported

## 5. Discussion

The present study examined the influence of Chinese Visual Packaging (CVP) on Purchase Intention (PI), considering the mediating role of Emotional Engagement (EE) and the moderating roles of Consumer Age (CA) and Sustainability Concerns (SC). The findings offer robust empirical validation for all four proposed hypotheses, emphasizing the significant influence of culturally inspired visual elements on consumers' behavior in the digital marketplace. The direct impact of CVP on PI (H1) was determined to be significant and positive ( $\beta = 0.685$ ,  $p < .001$ ), signifying that culturally enriched packaging substantially influences consumers' purchasing intentions. This discovery aligns with previous studies, which highlighted the significance of packaging aesthetics in shaping consumer behavior. Silayoi and Speece (2007) indicated that aesthetically pleasing packaging increases product appeal and acts as a significant signal for consumers in the decision-making process. Rundh (2016) contended that packaging serves not only as a protective and informational instrument but also as a marketing catalyst that influences consumers' perceptions and decisions.

This study demonstrates that integrating traditional Chinese visual elements increases the perceived cultural value of the product, thereby enhancing its appeal to consumers and directly influencing their purchase intentions. These findings are also consistent with the Stimulus–Organism–Response (S–O–R) framework, where CVP acts as a stimulus that triggers psychological and behavioral responses. The mediating function of emotional engagement (H2) was corroborated, with EE partially mediating the association between CVP and PI ( $\beta = 0.432$ ,  $p < .001$ ). This underscores that cultural packaging not only directly affects purchase intentions but also elicits emotional responses that further augment consumers' propensity to buy. This discovery corresponds with the research of Liu et al. (2025), who highlighted that emotional responses are fundamental mechanisms by which marketing stimuli influence consumer behavior. Furthermore, atmospheric cues in the digital environment have been shown to directly impact buying behavior by mediating through specific emotional states such as pleasure and arousal (Gao et al., 2023). Kozik (2026) posits that emotional engagement is a vital mediator between product presentation and purchasing behavior, indicating that consumers are more inclined to act when they experience positive emotions such as admiration, nostalgia, or cultural affinity. The partial mediation identified in this study indicates that although CVP directly affects PI, its capacity to elicit positive emotional responses enhances its influence, thereby validating the organism component of the S–O–R model. Similarly, in the context of e-commerce live streaming, characteristics of the digital environment have been proven to drive purchase intentions primarily by mediating through consumer sentiments, reinforcing the centrality of the organismic state in the S–O–R framework (Liu et al., 2025). These findings emphasize the psychological mechanism underlying culturally inspired packaging: it captures attention and establishes an emotional connection with consumers, thereby enhancing their likelihood of purchase. The moderation analysis indicated that consumer age significantly enhances the relationship between CVP and PI (H3:  $\beta = 0.214$ ,  $p = .012$ ). This discovery indicates that age-related variations significantly influence consumers' reactions to cultural packaging. Older consumers may possess a heightened appreciation for traditional visual aesthetics or cultural heritage, resulting in increased purchase intentions when exposed to CVP. This outcome aligns with the findings of Donthu (2021), who observed that demographic factors, including age, impact product perception and purchasing behavior, and Chang (2023), who emphasized that generational disparities may influence responsiveness to marketing stimuli. The findings suggest that marketing strategies

utilizing culturally rich packaging should be customized for specific age demographics, as older consumers may find greater value and emotional connection in traditional aesthetics than their younger counterparts.

Sustainability concerns were observed to negatively moderate the relationship between CVP and PI (H4:  $\beta = -0.185$ ,  $p = .008$ ), indicating that consumers with heightened environmental awareness are less swayed by cultural visual elements. This aligns with previous studies that highlight that sustainability-oriented consumers prioritize environmental and ethical factors over aesthetic or cultural considerations in their purchasing decisions (Chang, 2023; Donthu, 2021). Although cultural packaging typically enhances purchase intention, consumers who prioritize environmental concerns regarding packaging experience a diminished effect due to the negative moderation. This finding provides a comprehensive overview of how moderating factors can shape the effectiveness of marketing stimuli, highlighting that aesthetic appeal may not be sufficient for consumers whose purchase decisions are strongly guided by sustainability values. The correlation and descriptive analyses reinforce these findings. CVP, EE, and PI exhibited robust positive correlations (ranging from 0.685 to 0.788,  $p < .01$ ), substantiating the premise that cultural packaging not only captures attention but also enhances emotional engagement and stimulates purchasing behavior. Moderating variables—consumer age and sustainability concerns—exhibited moderate correlations with the primary constructs, signifying variability in consumer responses and validating their incorporation into the model. Skewness and kurtosis values for all variables fell within acceptable ranges, confirming data normality and the suitability of parametric testing, including regression and mediation/moderation analyses. Collectively, these findings illustrate the importance of incorporating cultural aesthetics into packaging strategies to improve consumer engagement and purchasing intention. They enhance the theoretical comprehension of the S–O–R model by illustrating that cultural packaging acts as a stimulus that elicits emotional responses (organism), which subsequently result in behavioral outcomes (response). Additionally, the effects of age and concerns about sustainability highlight the need for marketing strategies that target specific groups, as differences among individuals can greatly affect how well visual elements work. This study offers substantial empirical evidence that culturally inspired visual packaging increases purchase intention both directly and indirectly via emotional engagement, with age intensifying and sustainability concerns diminishing its effects. These findings align with previous literature and enhance current understanding by offering a comprehensive model that incorporates stimulus, emotional response, and moderating factors in forecasting consumer purchase behavior regarding culturally rich agricultural packaging.

## 6. Recommendation

This study's findings yield several recommendations for practitioners and policymakers in agricultural product marketing and e-commerce.

**Incorporate Cultural Elements into Packaging:** The significant positive influence of Chinese Visual Packaging (CVP) on Purchase Intention indicates that marketers ought to create packaging that integrates traditional and culturally significant visual components. This method captures attention and amplifies emotional involvement, resulting in an increased probability of purchase. Agricultural enterprises and e-commerce platforms can employ culturally relevant imagery, symbols, and color palettes that resonate with specific consumer segments to enhance the brand's attractiveness.

**Utilize Emotional Engagement:** Given that emotional engagement partially mediates the relationship between the Chinese Visual Packaging and purchase intention, companies should deliberately design packaging experiences that elicit positive emotions. Such designs may encompass narrative elements on the packaging, employing imagery that evokes nostalgia, or incorporating interactive digital features (e.g., QR codes directing to cultural narratives or product origins) to strengthen the consumer's emotional bond with the product.

**Age-Segmented Marketing:** The moderating influence of consumer age suggests that older

consumers exhibit greater responsiveness to cultural packaging. Consequently, marketing campaigns must customize packaging and promotional strategies for various age demographics. Integrating cultural elements with contemporary designs may enhance engagement among younger consumers, whereas traditional designs may be more effective for older demographics.

**Evaluate Sustainability Preferences:** Concerns regarding sustainability were identified as diminishing the impact of Chinese Visual Packaging (CVP) on purchase intention. This indicates that environmentally aware consumers value eco-friendly packaging more than visual attractiveness. Marketers must consequently harmonize cultural visual appeal with sustainable packaging alternatives, such as recyclable or biodegradable materials, to attract both culturally inclined and environmentally conscious consumers.

**Policy Implications for Sustainable Marketing:** Policymakers and trade organisations can facilitate cultural packaging initiatives by offering guidelines or incentives for the incorporation of cultural identity in product packaging while simultaneously promoting the use of environmentally sustainable materials. This dual focus on cultural authenticity and sustainability can bolster consumer trust and promote long-term engagement.

## 7. Conclusion

This study examined the impact of Chinese Visual Packaging (CVP) on Purchase Intention (PI), exploring the mediating effect of Emotional Engagement (EE) and the moderating effects of Consumer Age (CA) and Sustainability Concerns (SC). The findings validate that culturally enriched packaging serves as an effective marketing instrument: it directly increases purchase intention, partially functions through emotional engagement, and its efficacy fluctuates based on consumer age and sustainability consciousness. The results corroborate the Stimulus–Organism–Response (S–O–R) framework, indicating that Chinese Visual Packaging (CVP) acts as a stimulus that provokes emotional responses (organism), subsequently influencing purchase behavior (response). The study emphasizes the significance of individual differences in influencing marketing outcomes: older consumers exhibit a more favorable response to cultural cues, while heightened sustainability concerns diminish the effect of aesthetic appeal. This study theoretically enhances the literature by incorporating cultural, emotional, and demographic factors into the comprehension of purchasing behavior in digital marketplaces. This study builds upon previous research on packaging aesthetics (Silayoi & Speece, 2007; Rundh, 2016) by explicitly connecting cultural visual elements to emotional engagement and emphasizing the moderating influence of age and sustainability considerations. The study offers practical insights for marketers, indicating that the integration of cultural design elements with emotionally resonant features and sustainable packaging can enhance consumer response. By comprehending the intricate influences of demographic and attitudinal moderators, companies can formulate more efficient, targeted packaging strategies that resonate with varied consumer segments. Culturally inspired visual packaging not only looks good but also encourages people to buy, especially when it connects emotionally, considers different age preferences, and includes sustainable elements. Subsequent research may examine cross-cultural comparisons and assess additional moderating variables, including income, cultural familiarity, or digital literacy, to enhance comprehension of consumer behavior within the realm of cultural and sustainable marketing.

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