

# A Study on the Mediating Role of Social Media Platforms in the Influence of Sustainable and Culturally Resonant Packaging Characteristics on Consumer Brand Perception

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## summary

Against the backdrop of consumption upgrading, the popularization of environmental protection concepts, and the enhancement of cultural confidence, sustainable packaging and culturally resonant packaging have become core elements for differentiated competition among cosmetic brands, while social media has become a key channel for disseminating packaging characteristics and cultivating brand awareness. This paper takes the Chinese cosmetic market as the research scenario, focusing on five core variables: sustainable packaging characteristics, culturally resonant packaging characteristics, social media influence, brand awareness, and purchase intention. It explores the mediating role of social media platforms in the influence of packaging characteristics on consumer brand awareness. A combination of quantitative and qualitative research methods was employed. A questionnaire survey was used to collect 371 valid samples, SPSS was used for empirical testing, and network ethnography was used for qualitative analysis. The results show that both sustainable packaging characteristics and culturally resonant packaging characteristics have a significant positive impact on consumer brand awareness; social media plays a partial mediating role in the influence of both packaging characteristics on brand awareness; and brand awareness has a significant positive driving effect on consumer purchase intention. The research findings enrich the field of packaging characteristics and brand awareness, providing practical references for cosmetic companies to optimize packaging strategies and utilize social media to enhance brand awareness.

**Keywords:** social media; sustainable packaging; culturally resonant packaging; brand awareness; mediating role

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## 1 INTRODUCTION

### 1.1 Research Background

With the rapid development of social media, Chinese consumers are increasingly inclined to purchase cosmetics through online channels, changing traditional shopping patterns and posing new challenges and opportunities to cosmetic brands' marketing strategies (Ren, Zhang, & Gao, 2022) . According to data from China's National Bureau of Statistics, the total retail sales of cosmetics in China reached 414.2 billion yuan in 2023, a year-on-year increase of 5.1%, with approximately 70% of consumers choosing to purchase cosmetics through online platforms such as Douyin, JD.com, Xiaohongshu, and Tmall (Development Research Center of State Administration for Market Regulation of China, 2024) . On social media platforms like Xiaohongshu, beauty-related content dominates the creation charts, highlighting the core role of social media in cosmetic brand communication (Liu, 2020) .

Driven by consumption upgrades and personalized demands, consumers are not only focusing on efficacy and ingredient safety when choosing cosmetics, but also paying more attention to the sustainability and cultural connotations of packaging design (Wu, 2024) . Currently, the trend towards sustainable and environmentally friendly packaging is evident. Under the national "dual-carbon" strategy, relevant national packaging standards are constantly being revised, and environmentally friendly materials and recycling strategies are widely used (National Conditions Survey and Big Data Research Center, Chinese Academy of Social Sciences, 2024) . At the same time, Chinese cosmetic brands suffer from homogenization in their packaging, neglecting cultural and emotional resonance with consumers. Combining sustainability with cultural resonance has become key to enhancing brand perception and loyalty (Zhao, Li, & Wang, 2021) . Against this backdrop, exploring how social media mediates the impact of packaging characteristics on brand perception has significant theoretical and practical value.

### 1.2 Significance of the Research

#### 1.2.1 Theoretical Significance

This study expands the research dimensions of packaging characteristics by combining sustainability and

cultural resonance attributes, thus addressing the shortcomings of existing studies that often focus solely on single-attribute packaging. It clarifies the partial mediating role of social media in the "packaging characteristics-brand perception" path, refines the scenario heterogeneity of the mediating effect, and improves the research system on the relationship between social media and brand perception. Using the Chinese cosmetics market as a case study, it verifies the relationship model among core variables, enriches empirical research on local consumer behavior, and provides a reference for cross-industry research.

#### 1.2.2 Practical Significance

The research findings can provide cosmetic companies with clear directions for packaging design and marketing, guide them in creating packaging with both sustainability and cultural resonance, and leverage social media to amplify the dissemination effect; provide reference for social media platforms to optimize content ecology and accurately push content; and provide a basis for industry regulators to standardize the packaging market, promote green development and cultural dissemination, thus contributing to the high-quality development of the industry.

#### 1.3 Research Gaps

Existing research has three gaps: first, there is a lack of integrated research on sustainability and cultural resonance packaging, with few exploring the mechanisms by which the two synergistically affect brand perception; second, there is limited understanding of the specific effects of social media platforms, neglecting the impact of communication differences across different platforms on packaging perception; and third, there is a lack of quantitative assessment of the synergistic effect of sustainability and cultural resonance, making it difficult to provide a scientific basis for brand strategies. This study focuses on these gaps and conducts targeted empirical research.

#### 1.4 Research Content and Framework

This paper focuses on "the mediating role of social media in brand perception through sustainable and culturally resonant packaging characteristics," and is divided into five chapters: the introduction elaborates on the research background, significance, and gaps; the research methodology clarifies the research design, variable definition, and measurement tools; the research process includes the implementation and analysis of quantitative and qualitative research; the research conclusions summarize the core findings, limitations, and future prospects; and finally, a complete research loop is formed.

## 2 RESEARCH METHODS

### 2.1 Research Design

This paper employs a hybrid research design combining quantitative verification and qualitative corroboration, with quantitative research as the primary method and qualitative research as a supplement. Quantitative research collects data through questionnaires to test the relationship between research hypotheses and variables; qualitative research uses network ethnography to uncover consumers' cognitive logic and behavioral characteristics, compensating for the lack of in-depth explanation in quantitative research, and forming a mutually corroborating research chain.

### 2.2 Research Variables and Models

#### 2.2.1 Definition of core variables

1. Independent variable: Packaging attributes (PP), encompassing two major characteristics: sustainability (X1) and cultural resonance (X2). Sustainability refers to the environmental friendliness of packaging materials and the minimal environmental impact of the design; cultural resonance refers to the high degree of compatibility between the packaging and the consumer's cultural background, evoking emotional resonance (Zhu, 2018; Qin, 2022) .

2. Mediating variable: Social media influence (SM), which refers to the impact of social media on the exposure of packaging features and the formation of brand awareness through content dissemination, interactive sharing, etc. (Meng, 2020) .

3. Dependent variables: Brand perception (BP), which refers to consumers' overall impression and evaluation of a brand ( Yuan et al., 2020 ; Keller, 1993; Aaker, 1996) ; Purchase intention (PI), which refers to consumers' desire to purchase a product, as an extension of brand perception (Rizkianti, Kurniawati, 2021) .

#### 2.2.2 Research Model

Based on UGT and SOR theories, this study constructs a research model to explore the pathway by which packaging attributes influence brand perception through social media, thereby driving purchase intention.

Five research hypotheses are proposed: H1 (Sustainable packaging positively influences brand perception), H2 (Cultural resonance packaging positively influences brand perception), H3 (Social media plays a partial mediating role in the influence of sustainable packaging on brand perception), H4 (Social media plays a partial mediating role in the influence of cultural resonance packaging on brand perception), and H5 (Brand perception positively influences purchase intention). This study primarily examines H3, the partial mediating role of social media in the influence of sustainable packaging on brand perception . (Figure 1 )

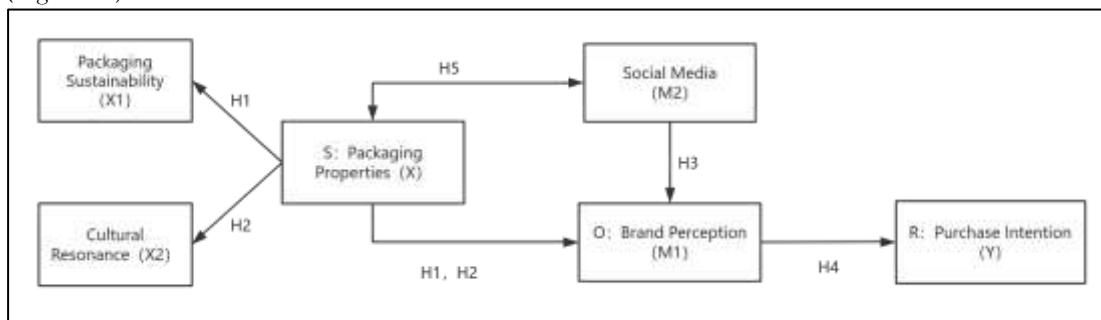


Figure 1 Research Model

### 2.3 Measuring tools

The quantitative study employed a questionnaire survey. Based on existing literature and a pre-test, a formal questionnaire with 19 items was designed, covering 5 dimensions: packaging sustainability (4 items), packaging cultural resonance (4 items), brand awareness (4 items), social media influence (4 items), and purchase intention (3 items). A 5-point Likert scale was used for scoring.

Qualitative research used NVivo for data coding, combined with semi-structured interview outlines and sentiment analysis tools, to collect social media texts, interview content, and open-ended questionnaire responses, constructing a three-level coding system to support hypothesis testing.

### 2.4 Research Subjects and Sampling Methods

The study subjects were Chinese cosmetics consumers, with a focus on active users of Xiaohongshu (Little Red Book), covering different ages, genders, regions, and consumption levels. A stratified random sampling method was used, with age, gender, region, and social media usage habits identified as stratification variables. Different subgroups were defined, and sample sizes were determined. A total of 371 valid samples were collected, with an effective recovery rate of 82.26%, meeting the statistical requirements (Aoyama (1954)) . (Table 1 )

Table 1 Steps for Stratified Random Sampling

step	Specific operations
Determine the stratification variables	In this study, four stratified variables were identified: age, gender, region, and social media usage habits.
Divide the whole	Based on stratified variables, the population is divided into several subgroups. For example, based on age, it is divided into three subgroups: 18-25 years old, 26-45 years old, and 46 years old and above ; based on gender, it is divided into two subgroups: male and female; based on region, it is divided into two subgroups: major city centers and second-tier cities; and based on social media usage habits, it is divided into subgroups: those who frequently use the Xiaohongshu platform and those who use it infrequently or not at all.
Determine the sample size for each layer	The sample size for each stratum is determined based on its proportion in the overall population and the needs of the research. For example, if major city centers account for a large proportion of the overall population, and the research suggests that consumer behavior in these areas has a significant impact on the overall population, the sample size for these areas can be appropriately increased.

Random sampling is performed within each layer.	Within each subgroup, a certain number of participants are selected using simple random sampling, systematic sampling, or other suitable random sampling methods. For example, a certain number of participants are randomly selected from the 18-25 age group subgroup.
Merging samples from each layer	The samples extracted from each layer are combined to form the final research sample. This ensures a balanced distribution of the sample across all key dimensions, while also guaranteeing the randomness and unbiasedness of the sampling.

### 3. RESEARCH PROCESS

#### 3.1 Quantitative Research Process and Analysis

##### 3.1.1 Data Collection

Formal questionnaires were distributed through the Wenjuanxing platform to active Xiaohongshu users and cosmetics consumers in first- and second-tier cities in China. A total of 451 questionnaires were distributed. After initial screening and fine screening to remove invalid samples, 371 valid samples were obtained. The sample data is complete and there is no need to impute missing values; it can be directly used for subsequent analysis. (Table 2 )

Table 2 Demographic characteristics of the sample

name	Options	Frequency	Percentage (%)
1. Your age is:	18-25 ( Gen Z)	168	45.28
	26-45 (Millennials)	189	50.94
	46+	13	3.77
2. Your gender:	female	251	67.65
	Male	120	32.35
3. Your educational background:	College	51	13.75
	undergraduate	290	78.17
	Postgraduate and above	17	4.58
	High school/vocational school	13	3.50
4. Your monthly cosmetics spending budget:	1000-2000 yuan	74	19.95
	500-1000 yuan	153	41.24
	<500 yuan	130	35.04
	>2000 yuan	14	3.77
5. Frequency of Xiaohongshu usage	Frequent use (more than 3 times per week)	169	45.6
	Use frequently ( 1-2 times/week)	127	34.2
	Use occasionally (1-2 times/month)	75	20.2
total		371	100.0

The categorical summary analysis shows that there are certain differences in the scores of samples of different ages and city levels in each core dimension, but the overall distribution is balanced and there is no obvious sample bias, which can ensure the universality of the research results.

##### 3.1.2 Data Quality Inspection

1. Normality Test: A KS normality test was performed on all 19 core items. The results showed that the p-values corresponding to the KS statistic for each item were all <0.05, indicating that none of the items exhibited normality. Therefore, subsequent correlation analysis employed non-parametric tests (Spearman correlation), regression analysis, and other methods, combined with data characteristics, for adaptation adjustments to ensure the accuracy of the statistical results (Drezner & Zerom, 2010; Lilliefers, 1967; Kline, 2011) . (Table 3 )

Table 3 Results of Normality Test

name	Sample size	average value	Standard deviation	Skewness	Kudo	Kolmogorov-Smirnov test	Shapiro-Wilk test
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						Statistic D value	p	Statistic W value	p
PS1	371	3.790	0.903	-0.658	0.462	0.266	0.000**	0.862	0.000**
PS2	371	3.811	0.914	-0.601	0.226	0.253	0.000**	0.866	0.000**
PS3	371	3.854	0.945	-0.654	0.115	0.249	0.000**	0.864	0.000**
PS4	371	3.830	0.919	-0.603	0.198	0.247	0.000**	0.866	0.000**
CR1	371	3.763	0.955	-0.503	0.146	0.234	0.000**	0.877	0.000**
CR2	371	3.790	0.921	-0.490	0.058	0.237	0.000**	0.873	0.000**
CR3	371	3.779	0.930	-0.642	0.252	0.262	0.000**	0.867	0.000**
CR4	371	3.736	0.879	-0.321	0.225	0.235	0.000**	0.875	0.000**
BP1	371	3.849	0.888	-0.376	0.593	0.244	0.000**	0.863	0.000**
BP2	371	3.922	0.880	-0.301	0.816	0.209	0.000**	0.855	0.000**
BP3	371	3.925	0.894	-0.376	0.731	0.218	0.000**	0.856	0.000**
BP4	371	3.860	0.871	-0.267	0.723	0.224	0.000**	0.862	0.000**
SM1	371	3.544	0.882	-0.231	0.014	0.215	0.000**	0.881	0.000**
SM2	371	3.585	0.879	-0.572	0.162	0.288	0.000**	0.862	0.000**
SM3	371	3.633	0.889	-0.420	0.098	0.248	0.000**	0.877	0.000**
SM4	371	3.542	0.898	-0.205	0.214	0.215	0.000**	0.886	0.000**
PI1	371	3.555	1.143	-0.628	0.300	0.239	0.000**	0.882	0.000**
PI2	371	3.642	0.941	-0.365	0.315	0.236	0.000**	0.886	0.000**
PI3	371	3.577	1.096	-0.649	0.092	0.238	0.000**	0.881	0.000**

\* p < 0.05 \*\* p < 0.01

2. Confirmatory factor analysis (CFA): SPSS was used for CFA to test 5 factors (PS, CR, BP, SM, PI) and 19 analytical items, focusing on validating the convergent validity, discriminant validity, and model fit of the scale. For each measurement relationship, the absolute values of the standardized loadings were all greater than 0.6 and showed significance, indicating a good measurement relationship. Specific results and model results are shown in Table 4 :

Table 4 Factor Loading Coefficients

Factor ( latent variable )	Measurement item ( manifest variable )	Non-standard load factor ( Coef. )	Standard Error	z ( CR value )	p	Standard load factor ( Std. Estimate )	SMC
Packaging Sustainability	PS1	1.000	-	-	-	0.856	0.733
Packaging Sustainability	PS2	0.896	0.053	16.909	0.000	0.758	0.575
Packaging Sustainability	PS3	0.984	0.053	18.466	0.000	0.805	0.648
Packaging Sustainability	PS4	1.001	0.051	19.743	0.000	0.842	0.709

Packaging Cultural Resonance	CR1	1.000	-	-	-	0.892	0.795
Packaging Cultural Resonance	CR2	0.775	0.049	15.851	0.000	0.716	0.513
Packaging Cultural Resonance	CR3	0.879	0.047	18.809	0.000	0.805	0.648
Packaging Cultural Resonance	CR4	0.825	0.044	18.571	0.000	0.798	0.637
Brand Perception	BP1	1.000	-	-	-	0.961	0.923
Brand Perception	BP2	0.773	0.040	19.092	0.000	0.749	0.561
Brand Perception	BP3	0.829	0.039	21.148	0.000	0.791	0.625
Brand Perception	BP4	0.836	0.037	22.725	0.000	0.819	0.671
Social Media Influence	SM1	1.000	-	-	-	0.978	0.956
Social Media Influence	SM2	0.700	0.040	17.485	0.000	0.687	0.472
Social Media Influence	SM3	0.664	0.042	15.713	0.000	0.645	0.416
Social Media Influence	SM4	1.009	0.021	48.591	0.000	0.970	0.941
Purchase Intention	PI1	1.000	-	-	-	1.000	1.000
Purchase Intention	PI2	0.637	0.029	21.858	0.000	0.774	0.599
Purchase Intention	PI3	0.823	0.029	28.324	0.000	0.859	0.737

Note: A horizontal bar '-' indicates that the item is a reference item.

Model fit:  $\chi^2=389.096$ ,  $df=142$ ,  $\chi^2/df=2.740$  ( $<3$ , meets the fit standard); GFI=0.901 ( $>0.9$ ), RMSEA=0.069 ( $<0.10$ , good fit); RMR=0.060, SRMR=0.070; CFI=0.955 ( $>0.9$ ), NFI=0.931 ( $>0.9$ ), NNFI=0.945 ( $>0.9$ ), TLI=0.945 ( $>0.9$ ); AGFI=0.865 (close to 0.9); AIC=93.902, BIC=281.880. All core fit indicators met the standards, the scale structure and data were well-matched, and the model was effective overall ( Table 5).

Table 5 Model Fit Indices

Common indicators	$\chi^2$	df	p	Chi-square degrees of freedom ratio $\chi^2/df$	GFI	RMSEA	RMR	CFI	NFI	NNFI
Judgment criteria	-	-	$>0.05$	$<3$	$>0.9$	$<0.10$	$<0.05$	$>0.9$	$>0.9$	$>0.9$
value	389.096	142	0.000	2.740	0.901	0.069	0.060	0.955	0.931	0.945

Other indicators	TLI	AGFI	IFI	PGFI	PNFI	PCFI	SRMR	RMSEA 90% CI		
Judgment criteria	>0.9	>0.9	>0.9	>0.5	>0.5	>0.5	<0.1	-		
value	0.945	0.935	0.955	0.672	0.773	0.793	0.070	0.060 ~ 0.077		

Note: For the Default Model,  $\chi^2 (171) = 5629.161$ ,  $p = 1.000$   
AIC = 93.902, BIC = 281.880

The mean variance extracted (AVE) for each dimension is greater than 0.5, and the combined reliability (CR) is greater than 0.7, specifically: PS (AVE=0.666, CR=0.888), CR (AVE=0.648, CR=0.880), BP (AVE=0.695, CR=0.900), SM (AVE=0.696, CR=0.898), and PI (AVE=0.779, CR=0.913), which fully meet the convergent validity requirements (Table 6).

Table 6 Results of AVE and CR indices for the model

Factor	Mean variance extracted AVE value	Combined reliability CR value
Packaging Sustainability	0.666	0.888
Packaging Cultural Resonance	0.648	0.880
Brand Perception	0.695	0.900
Social Media Influence	0.696	0.898
Purchase Intention	0.779	0.913

3. Reliability test: Cronbach's  $\alpha$  coefficient = 0.792, standardized Cronbach's  $\alpha$  coefficient = 0.794. The CITC values of each item and the deleted  $\alpha$  coefficients of each item meet the standard, indicating good reliability of the scale (Table 7).

Table 7 Reliability Analysis Results

name	Total Correlation of Correction Items (CITC)	The $\alpha$ coefficient of the deleted term	Cronbach's $\alpha$ coefficient
PI	0.698	0.711	0.794
SM	0.695	0.718	
BP	0.396	0.807	
CR	0.431	0.797	
PS	0.678	0.722	

Note: Standardized Cronbach's  $\alpha$  coefficient = 0.792

### 3.1.3 Hypothesis Testing

1. Correlation analysis: Since none of the items are normal, Spearman correlation coefficient test was used. The results showed that there was a significant positive correlation among the core variables, which laid the foundation for hypothesis testing (Table 8).

Table 8 Results of Correlation Analysis

	average value	Standard deviation	PI	SM	BP	CR	PS
PI	3.591	0.970	1				
SM	3.576	0.777	0.637**	1			
BP	3.889	0.775	0.403**	0.341**	1		
CR	3.767	0.789	0.391**	0.317**	0.097	1	
PS	3.821	0.796	0.692**	0.595**	0.439**	0.270**	1

\*  $p < 0.05$  \*\*  $p < 0.01$

2. Mediation effect test: Using the SPSS mediation analysis module, the results showed that social media played a partial mediating role between packaging attributes and brand awareness, with both direct and indirect effects being significant; brand awareness had a significant positive impact on purchase intention, and all research hypotheses were verified (Table 9).

Table 9 Testing of the Mediation Effect Model

	SM					BP					BP				
	B	Standard error	t	p	$\beta$	B	Standard error	t	p	$\beta$	B	Standard error	t	p	$\beta$
constant	0.725*	0.187	3.882	0.000	-	2.377**	0.225	10.541	0.000	-	2.186**	0.225	9.724	0.000	-
PP	0.752*	0.048	15.497	0.000	0.628	0.398*	0.059	6.803	0.000	0.334	0.200*	0.074	2.726	0.007	0.168
SM											0.263*	0.061	4.287	0.000	0.263
R <sup>2</sup>	0.394					0.111					0.154				
Adjusted R <sup>2</sup>	0.393					0.109					0.149				
F value	F (1,369)=240.169, p =0.000					F (1,369)=46.274, p =0.000					F (2,368)=33.418, p =0.000				

\* p < 0.05 \*\* p < 0.01

From the table above, we can see that the total effect test (c) shows that the regression coefficient of the independent variable PP on the dependent variable BP is  $c=0.398$  ( $p=0.000<0.01$ ), which is significant. This indicates that the total effect exists and can be analyzed as a mediation effect. Mediation path tests (a, b): Path a: The regression coefficient of the independent variable PP on the mediator variable SM is  $a=0.752$  ( $p=0.000<0.01$ ), which is significant. Path b: The regression coefficient of the mediator variable SM on the dependent variable BP is  $b=0.263$  ( $p=0.000<0.01$ ), which is significant. Since both a and b are significant, the mediation effect exists. Direct effect test (c'): After adding the mediator variable SM, the direct effect of the independent variable PP on the dependent variable BP is  $c'=0.200$  ( $p=0.007<0.01$ ), which is still significant.

Table 10 Summary of Effect Analysis Process

effect	item	Effect	SE	t	p	LLCI	ULCI
direct effects	PP $\Rightarrow$ BP	0.200	0.074	2.726	0.007	0.056	0.345
Indirect effect process	PP $\Rightarrow$ SM	0.752	0.048	15.497	0.000	0.656	0.847
	SM $\Rightarrow$ BP	0.263	0.061	4.287	0.000	0.143	0.384
Total effect	PP $\Rightarrow$ BP	0.398	0.059	6.803	0.000	0.283	0.514

Note: LLCI refers to the lower limit of the 95% range of the estimated value, and ULCI refers to the upper limit of the 95% range of the estimated value.

According to the mediation analysis results in Table 10, the direct effect of the PP $\rightarrow$ BP path is 0.200 ( $p = 0.007 < 0.01$ ), indicating that even after controlling for the mediating variable SM, the independent variable PP still has a significant direct impact on the dependent variable BP. Both the PP $\rightarrow$ SM path (coefficient  $a = 0.752$ ,  $p < 0.001$ ) and the SM $\rightarrow$ BP path (coefficient  $b = 0.263$ ,  $p < 0.001$ ) are significant, which is a prerequisite for the mediation effect to hold. The total effect is significant: the total effect of the PP  $\rightarrow$  BP path is 0.398 ( $p < 0.001$ ), equal to the direct effect (0.200) + the indirect effect (approximately 0.198). Effect type judgment: Since both the direct and indirect effects are significant and have the same direction (both positive), it belongs to a partial mediation effect. That is, PP directly affects BP and also partially affects BP through the mediating variable SM.

### 3.2 Qualitative Research Process and Analysis

#### 3.2.1 Data Collection and Preprocessing

Employing a "non-participant observation + in-depth interviews + targeted data extraction" model, we collected data from social media community discussions, brand comment sections, interview transcripts,

and open-ended questionnaire responses over a three-month period. After redundancy removal and standardization, a valid text database of approximately 42,000 words was created. Data saturation testing showed that both interviews and observations reached saturation, and the data can support subsequent analysis.

### 3.2.2 Data Coding and Reliability Testing

Using grounded theory's three-level coding logic, 43 initial concepts were extracted, clustered into 9 secondary themes, and 4 core themes were refined, each corresponding to one of the 4 research hypotheses. Industry experts were invited to independently code the hypotheses, achieving a Kappa value of 0.83, indicating good coding consistency and ensuring reliable results (Table 11).

Open coding: The raw data was parsed sentence by sentence, focusing on extracting initial concepts related to the four hypotheses, and prioritizing the retention of concepts that were repeated  $\geq 3$  times (Ma & Xu, 2026). Concepts such as "KOL recommendation amplifies the perception of packaging advantages" and "UGC sharing strengthens brand favorability" were extracted corresponding to the hypotheses, resulting in a total of 43 initial concepts (Table 11).

Table 11 Encoding Examples

Conceptual tags (frequency)	Representative statements
Cultural elements + sustainability → brand recognition ( 23)	The inclusion of blue and white porcelain elements, coupled with the biodegradable material, instantly boosted my positive impression of the brand.
Recyclable → Packaging sustainability ( 20)	Recyclable, and can also be used as a storage box after use, making it both environmentally friendly and stylish.
Environmentally friendly materials → Packaging sustainability ( 17)	Made of biodegradable plastic, it's simple, environmentally friendly, and gives me peace of mind.
Cultural elements → Brand recognition ( 46)	The packaging features embroidery and is made of biodegradable material, which gives me peace of mind and allows me to experience the charm of traditional culture.
Cultural elements → Brand recognition ( 13)	This kind of packaging looks great in photos posted on WeChat Moments and Xiaohongshu, and it's highly recognizable.
Cultural elements → Brand recognition ( 46)	I feel that this brand is not just about beauty products, but about inheriting the craftsmanship of intangible cultural heritage, with cultural confidence and social responsibility, rather than being a frivolous commercial brand.
Environmentally friendly materials → Packaging sustainability ( 17)	Eco-friendly glass and ceramic packaging have a more luxurious feel than plastic, making them more ceremonial to use.
Recyclable → Packaging sustainability ( 20)	The celadon vase can also be used as a storage box, which is equivalent to "buying one and getting two," making it more cost-effective.

Main axis coding: Through concept clustering and category integration, nine sub-topics are formed, each corresponding to the core dimensions of the four hypotheses, ensuring that the categories and hypotheses are linked one-to-one (Ma & Xu, 2026) (Table 12).

Table 12 Category Classification Codes

Category (frequency)	Conceptual tags (frequency)
The impact of social media on brand awareness (2)	Social Media → Brand Perception (2)
The amplification mechanism of	Social Media → Perceiving Packaging Attributes (28)

packaging attributes by social media (30)	Social Media → Feedback Packaging Cultural Attributes + Sustainability (1)
	Social Media → Feedback Packaging Sustainability (1)
Consumer social media packaging feedback behavior (38)	Obstacles → No feedback (24)
	Feedback → Brand Response (7)
	Feedback → Packaging Optimization (7)
Adjustment and optimization of brand packaging strategy (343)	Optimization suggestions → Visual (14)
	Optimization suggestion → Simplify (42)
	Optimization suggestion → Environmental protection + Culture (60)
	Optimization suggestion → Environmental protection (78)
	Optimization suggestions → Consumer feedback (1)
	Optimization suggestions → Culture (57)
	Optimization suggestions → Process (31)
	Optimization suggestions → Customization (7)
	Optimization suggestions → Internationalization (2)
	Optimization suggestions → Features (18)
	Optimization suggestions → Innovation (9)
	Optimization suggestions → Dissemination (12)
	Optimization suggestions → Price (12)
Consumers' perception of packaging culture resonance (73)	Packaging Design → Cultural Resonance (5)
	Packaging Colors → Cultural Resonance (11)
	Packaging patterns → Cultural resonance (31)
	Packaging materials → Cultural resonance (8)
	Packaging Technology → Cultural Resonance (18)
Cognition and Brand Association of Cultural Resonance Packaging (76)	Cultural elements → Purchase intention (10)
	Cultural elements → psychological satisfaction → purchase intention (1)
	Cultural elements → Brand recognition (13)
	Cultural elements → Brand appeal (1)
	Cultural elements → Brand recognition (46)
	Cultural elements → Brand shareability (5)
Consumers' perceptions and emotional inclinations toward sustainable packaging (46)	Environmental symbols → Packaging sustainability (5)
	Environmentally friendly materials → Packaging sustainability (17)
	Sustainability → Practicality → Willingness to Purchase (1)
	Sustainability → Brand Shareability (3)
	Recyclable → Packaging sustainability (20)
Synergistic Effects of Cultural Resonance and Sustainable Packaging (59)	Cultural elements + sustainability → purchase intention (19)
	Cultural elements + sustainability → premium → willingness to buy (3)
	Cultural elements + sustainability → brand recognition (4)
	Cultural elements + sustainability → Brand fun (1)
	Cultural elements + sustainability → brand recognition (23)
	Cultural elements + sustainability → Brand shareability (7)

	Cultural elements + sustainability → Packaging value (2)
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Selective coding: Four core themes are extracted, which precisely correspond to the four hypotheses, forming a three-level coding system of "core theme - secondary theme - initial concept". The correspondence between the coding system and the hypotheses is clarified, providing a clear analytical framework for subsequent hypothesis verification (Table 13) (Shi et al., 2025).

Table 13 Core Category Codes

Core categories	Category
Cultural resonance packaging → Brand awareness	Consumers' perception of resonance with packaging culture
	Cultural resonance packaging: perception and brand association
Social media amplifies the impact of sustainable and culturally resonant packaging on brand awareness.	The impact of social media on brand awareness
	The mechanism by which social media spreads packaging attributes
Synergy between sustainability and cultural resonance → Brand perception + Purchase intention	Consumers' perceptions and emotional inclinations towards sustainable packaging
	Synergistic Effects of Cultural Resonance and Sustainable Packaging
Consumer social media feedback → Brand packaging strategy adjustment	Consumer social media packaging feedback behavior
	Adjustment and optimization of brand packaging strategy

### 3.2.3 Qualitative Analysis Results

Qualitative research further validated the hypotheses: culturally resonant packaging strengthens brand awareness by conveying cultural connotations; social media amplifies the dissemination effect of packaging characteristics through the path of "KOL leadership → UGC diffusion → community discussion"; the synergistic effect of sustainability and culturally resonant packaging enhances brand recognition and purchase intention; and consumer feedback through social media drives the optimization of brand packaging strategies.

## 4. RESEARCH CONCLUSIONS

### 4.1 Core Research Conclusions

Based on the results of both quantitative and qualitative research, this paper draws the following core conclusions:

1. Both sustainable packaging characteristics and cultural resonance packaging characteristics have a significant positive impact on consumers' brand perception. Among them, the influence coefficient of cultural resonance packaging (0.672) is slightly higher than that of sustainable packaging (0.654), indicating that consumers' emotional value demand for packaging is higher than their rational environmental protection demand.
2. Social media plays a partial mediating role in the impact of both packaging characteristics on brand perception. The indirect effect of cultural resonance packaging on social media (0.236) is higher than that of sustainable packaging (0.227). This is because cultural resonance packaging is more likely to trigger spontaneous sharing by users on social platforms, thus expanding the scope of dissemination.
3. Brand awareness has a significant positive impact on consumers' purchase intention, with an impact coefficient as high as 0.756 and  $R^2=0.571$ . This indicates that brand awareness is the core factor driving purchase intention, and good brand awareness can reduce consumers' decision-making uncertainty and promote purchase conversion.
4. Consumers' demand for cosmetic packaging has shifted from functional satisfaction to value recognition. Social media has become the core channel for consumers to understand packaging characteristics and form brand awareness. The path of "eye-catching packaging - social media communication - awareness enhancement - purchase conversion" is feasible.

#### 4.2 Research Limitations

This study has the following limitations: First, the sample source is concentrated on the Xiaohongshu platform, and the coverage of regions, ages, and consumption levels is not comprehensive enough, affecting the generalizability of the conclusions; second, the research scenario only focuses on the Chinese cosmetics market and the Xiaohongshu platform, without extending to other industries and social platforms; third, it does not consider moderating variables such as individual consumer differences and brand types, resulting in insufficient comprehensiveness of the conclusions; and fourth, it uses cross-sectional data, which cannot reveal the dynamic changes among variables.

#### 4.3 Future Outlook

To address the limitations of this study, the following future directions are proposed: First, expand the sample size to cover consumers from different regions and consumption levels, thereby enhancing the generalizability of the conclusions; second, broaden the research scenarios to include industries such as food and skincare products, comparing the differences between different platforms and industries; third, introduce moderating variables to construct a more comprehensive research model; fourth, employ longitudinal tracking data, combining qualitative and quantitative methods to deeply analyze the dynamic relationships between variables; and fifth, pay attention to new forms of communication such as live-streaming e-commerce and AI recommendations, as well as trends such as IP-based packaging and environmental technology innovation, to enhance the timeliness and practicality of the research.

#### 5. Summary

This paper takes the Chinese cosmetics market as the research scenario and systematically explores the mediating role of social media in the influence of sustainable and culturally resonant packaging characteristics on consumer brand perception through a mixed research approach. It verifies all research hypotheses and clarifies the interaction mechanisms among core variables. This research not only enriches theoretical research in the fields of packaging characteristics, social media, and brand perception but also provides concrete practical insights for cosmetics companies to optimize packaging design and conduct social media marketing. Despite certain limitations, it provides a clear direction for future related research, helping the industry achieve the dual goals of green development and cultural dissemination.

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