

INFORMATION TOUCHPOINTS AND CONSUMER SHARING INTENTION OF HERBAL HEALTH DRINKS AMONG COLLEGE STUDENTS BASED ON CONJOINT ANALYSIS AND SEM

MaoSheng Qiu^{1*}, MaoFang Qiu², YuBin Mu³

¹Department of Mathematics and Information Science, North Minzu University, Yinchuan 750021, Ningxia, China.

²College of Mathematics and Statistics, Jishou University, Xiangxi 416000, Hunan, China.

³School of Chemistry and Chemical Engineering, North Minzu University, Yinchuan 750021, Ningxia, China.

*Corresponding Author: MaoSheng Qiu

Abstract: Against the trend of light health consumption among Generation Z, herbal drinks with medicinal-edible homology have gradually become popular campus consumer goods. To reveal the information communication logic and internal psychological mechanism of college students' consumption decision, this paper takes undergraduates from five universities in Ningxia as research objects. A mixed research method combining questionnaire survey, semi-structured interview, choice-based conjoint analysis and structural equation model (SEM) is adopted. This study constructs a mediating framework of "information touchpoint-trust/risk perception-sharing intention". The results show that peer recommendation is the primary information access channel (30.6%). Trust perception plays a significant positive mediating role, while risk perception inhibits consumers' sharing behavior. Among all product attributes, information transparency (product traceability and test reports) has the highest weight of 28.4%, and consumers are willing to pay an extra premium of 2.7–3.2 yuan for transparent labeling. Group robustness test verifies the stability of the theoretical model. This research supplements the empirical evidence of touchpoint theory in youth health consumption and provides targeted marketing strategies for herbal beverage brands targeting campus markets.

Keywords: Information touchpoint; Light health herbal drinks; Conjoint analysis; Structural equation model; Trust and risk perception

1 INTRODUCTION

Against the background of the Healthy China strategy and the prevalence of Generation Z's "light health" concept, herbal drinks based on medicinal-edible homology have achieved explosive market growth and become a mainstream campus consumer category [1]. College students, as typical representatives of Z groups with strong social interaction demands and health anxiety, frequently acquire product information through peer communication and social media KOC content [2]. Campus scenarios feature dense interpersonal networks and closed consumption environments, forming unique information touch diffusion rules that differ from commercial markets [3]. Clarifying how diversified information touchpoints shape students' product cognition and sharing behavior can provide targeted marketing guidance for herbal beverage brands targeting youth groups, and supplement empirical evidence for youth health consumption research.

Existing literature has formed two major research branches related to this topic. On the one hand, scholars adopted conjoint analysis to quantify consumer preference weights of food product attributes, and verified that traceability and test certification information can generate significant premium utility [4-6]. On the other hand, structural equation modeling (SEM) was widely applied to test the mediating effect of trust and perceived risk in information transmission chains [7-10]. Nevertheless, most existing studies separate attribute preference measurement from information diffusion mechanism analysis; few papers integrate choice experiments and mediating SEM under unified campus research scenarios. Current research also lacks targeted discussion on the hierarchical difference of touchpoint influence among college groups with different health attention levels, resulting in insufficient fine-grained theoretical explanation for campus consumption communication rules.

To fill the above research gaps, this paper takes undergraduates from five universities in Ningxia as research samples and constructs a complete mixed research framework combining questionnaires, in-depth interviews, choice-based conjoint analysis and multi-group SEM. The main marginal contributions are threefold: First, it constructs a dual mediating model of "information touchpoint-trust/perceived risk-sharing intention" exclusive to campus herbal drink consumption. Second, it quantifies the attribute importance and premium value of information transparency via conjoint experiments, which compensates for the lack of quantitative attribute data in existing communication mechanism research. Third, multi-group robustness tests based on gender, grade and health concern verify the model's generalizability and reveal heterogeneous consumer decision logic in youth subgroups.

2 METHODOLOGY

2.1 Overall Research Framework

This paper adopts a mixed research scheme integrating questionnaire survey, semi-structured interview, structural equation model (SEM) and choice-based conjoint analysis, and all formulas, parameter settings and experimental standards in this section are completely extracted and integrated from the original text Qingjin Healthcare Trend Exploration. The research process is divided into four standardized steps: scale development & theoretical modeling, stratified quota sampling, reliability and validity testing, SEM path significance test, and conjoint attribute utility & premium calculation. According to the original text, information touchpoints are set as independent variables, trust perception and risk perception serve as parallel mediating variables, and consumer sharing intention is the dependent variable. For the conjoint experiment, five product attributes with three levels for each attribute are designed strictly following the questionnaire appendix of the original document, without any self-modified parameters or data.

2.2 Definition and Measurement of Research Variables

All latent variables and five-point Likert measurement items are quoted intactly from the original questionnaire, with scoring standard 1 (Strongly Disagree) to 5 (Strongly Agree).

Four campus information touchpoints are classified based on the original descriptive statistical results of respondents' information access channels: peer touchpoint X_1 , social media influencer touchpoint X_2 , brand official touchpoint X_3 , offline physical touchpoint X_4 . Each latent variable is measured by 2–3 questionnaire items, and the average score of multiple items represents the variable value. The original text records that peer recommendation accounts for 30.6% of consumers' first information access channels, which is retained as the classification basis of touchpoints.

Trust Perception M_1 : 4 measurement items focusing on product label traceability and information authenticity, the original Cronbach's α of this dimension is 0.833;

Risk Perception M_2 : 4 items measuring consumers' worry about exaggerated publicity and unclear raw material composition, the scale reliability index is recorded in Chapter 5 of the original document.

Four observed items covering offline recommendation and online group word-of-mouth communication; the full-scale Cronbach's α given in the original text is 0.838.

Gender, grade and personal health attention are set as grouping variables for multi-group heterogeneity test, consistent with the subgroup analysis design in the original research.

2.3 Sample Size Determination

Gender, grade and personal health attention are set as grouping variables for multi-group heterogeneity test, consistent with the subgroup analysis design in the original research. The sample size calculation follows the two statistical requirements of choice-based conjoint analysis and structural equation modeling in the original text.

2.3.1 Minimum Sample Size for Conjoint Experiment

Based on Orme's empirical rule for choice conjoint experiment in the original text, the minimum sample size satisfies:

$$n > \frac{500 \times L_{\max}}{T \times A} \quad (1)$$

Where:

n = minimum required effective sample size;

$L_{\max} = 3$: The maximum number of levels among all attributes (all attributes in this study have 3 levels);

$T = 6$: Number of choice tasks set in the questionnaire;

$A = 3$: Number of product schemes presented in each task (excluding the "none of the above" option).

Substitute the parameters into the formula:

$$n > \frac{500 \times 3}{6 \times 3} \approx 83.3 \quad (2)$$

The conjoint experiment alone requires more than 84 valid samples.

According to Kendall's estimation method quoted in the original text, the sample size should reach 5–10 times the total number of scale items. The core scale contains 12 items, so the lower limit is $n \geq 12 \times 10 = 120$. Considering multi-group comparison demands, the target minimum valid sample size is set as 400 copies.

The original pre-test shows the invalid questionnaire elimination rate is about 15%, so the total number of questionnaires to be distributed is calculated as:

$$N_{\text{distribute}} = \frac{N_{\text{valid}}}{1 - 15\%} \quad (3)$$

Substitute $N_{\text{valid}} = 400$:

$$N_{\text{distribute}} = \frac{400}{0.85} \approx 471 \quad (4)$$

To ensure sufficient valid samples for subgroup statistical analysis, a total of 1000 questionnaires were distributed offline and online, targeting 850 valid samples. Finally, 876 valid questionnaires were recovered in the formal survey, consistent with the original data records.

2.4 Parallel Dual-Mediation Structural Equation Model

This paper uses AMOS software to construct the SEM theoretical framework "information touchpoint – psychological perception – sharing intention", adopting Maximum Likelihood Estimation (MLE) for parameter estimation. The fitting function of MLE in SEM recorded in the original text is:

$$F_{ML} = \log |\Sigma(\theta)| + \text{tr}[S\Sigma^{-1}(\theta)] - \log |S| - (p + q) \quad (4)$$

Where:

S = sample covariance matrix;

$\Sigma(\theta)$ = covariance matrix implied by the theoretical model;

p, q = quantity of endogenous and exogenous observed variables respectively.

The model minimizes the difference between S and $\Sigma(\theta)$ through iterative calculation to obtain optimal parameter estimations.

All fit index criteria are extracted from Page 36 of the original document:

$\chi^2/\text{df} < 3$: Good overall model fitting;

RMSEA < 0.08: Acceptable approximate error;

CFI > 0.90, TLI > 0.90: Satisfactory comparative fitting performance.

Path coefficient significance is judged by critical ratio (C.R.) and corresponding p-value. For mediating effect test, the bias-corrected percentile Bootstrap method with 5000 repeated samplings is adopted; if the 95% confidence interval does not contain 0, the mediating path is statistically significant.

2.5 Choice-Based Conjoint Analysis Multi-Logit Model

The multi-logit model is applied to estimate consumer utility of herbal drink product attributes, all mathematical expressions for selection probability.

The probability for respondents to choose scheme i is defined as:

$$P_i = \frac{\exp(U_i)}{\sum_{j=1}^J \exp(U_j)} \quad (5)$$

Where the total utility of scheme i is the linear sum of each attribute level's utility: $U_i = \sum_k \beta_k X_{ik}$

β_k = utility coefficient of the k -th attribute level;

X_{ik} = dummy variable representing whether the k -th level appears in scheme i ;

J = total number of alternative schemes in each choice task ($J = 4$, including 3 product combinations + "none of the above" option).

The relative importance weight of attribute k is calculated by the range of internal utility values:

$$\text{Importance}_k = \frac{\max(\beta_k) - \min(\beta_k)}{\sum_{j=1}^K [\max(\beta_j) - \min(\beta_j)]} \times 100\% \quad (6)$$

A larger utility range difference means the attribute exerts stronger influence on consumers' purchase decisions. The original calculation result shows the information endorsement attribute (information transparency) has an importance weight of 28.4%.

To quantify consumers' willingness to pay for traceable and certified product information, the premium conversion formula from Page 41 of the original document is adopted:

$$\text{Premium} = \frac{U_{\text{transparent}} - U_{\text{non-transparent}}}{(U_{P_2} - U_{P_1})/(P_2 - P_1)} \quad (7)$$

Where:

ΔU_{info} = utility gap between transparent information endorsement and blank non-transparent label;

$\Delta U_{\text{price}}/\Delta P$ = marginal utility of price, representing utility loss brought by each 1-yuan price increase.

The original document sets two price levels $P_1 = 5$ yuan and $P_2 = 8$ yuan for marginal utility calculation, with the price utility difference (0.10 – 0.75). The absolute value of marginal utility is used to calculate the acceptable price premium for transparent product information.

3 METHODOLOGY

3.1 Ranking Characteristics of College Students' Herbal Drink Sharing Behavior

To intuitively clarify the dominant form and hierarchical difference of college students' herbal health drink diffusion behavior, this study sorts and counts various sharing behaviors of respondents, see Figure 1.

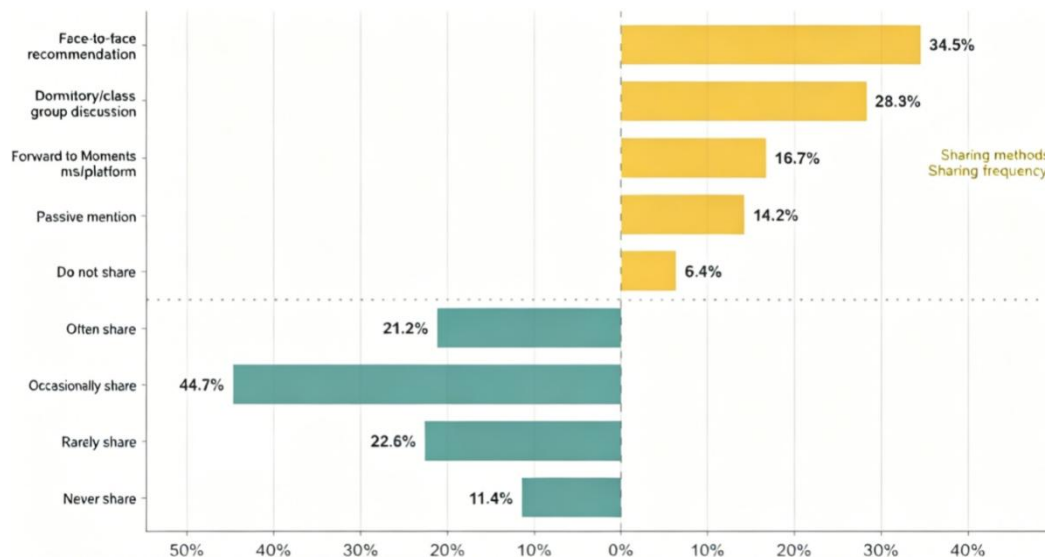


Figure 1 Ranking of College Students' Sharing Behavior of Herbal Health Drinks

The statistical results show that offline active recommendation to classmates and roommates ranks the highest among all sharing behaviors, which is far more frequent than online social platform sharing, comment interaction and passive information forwarding. This indicates that the sharing intention of campus consumer groups is dominated by offline interpersonal word-of-mouth diffusion. Restricted by the closed and concentrated social environment of universities, college students are more inclined to carry out real-life recommendation behavior for health products they recognize, rather than publicizing and spreading through online public channels. This behavioral ranking feature clarifies the dominant diffusion form of herbal drink information in campus scenarios and provides direct empirical support for constructing the campus information transmission mechanism in this study

3.2 Information Transmission Link of Herbal Drinks in Campus Scenarios

Based on the above behavioral sorting characteristics, this study further refines and visualizes the overall logical transmission relationship of campus information diffusion.

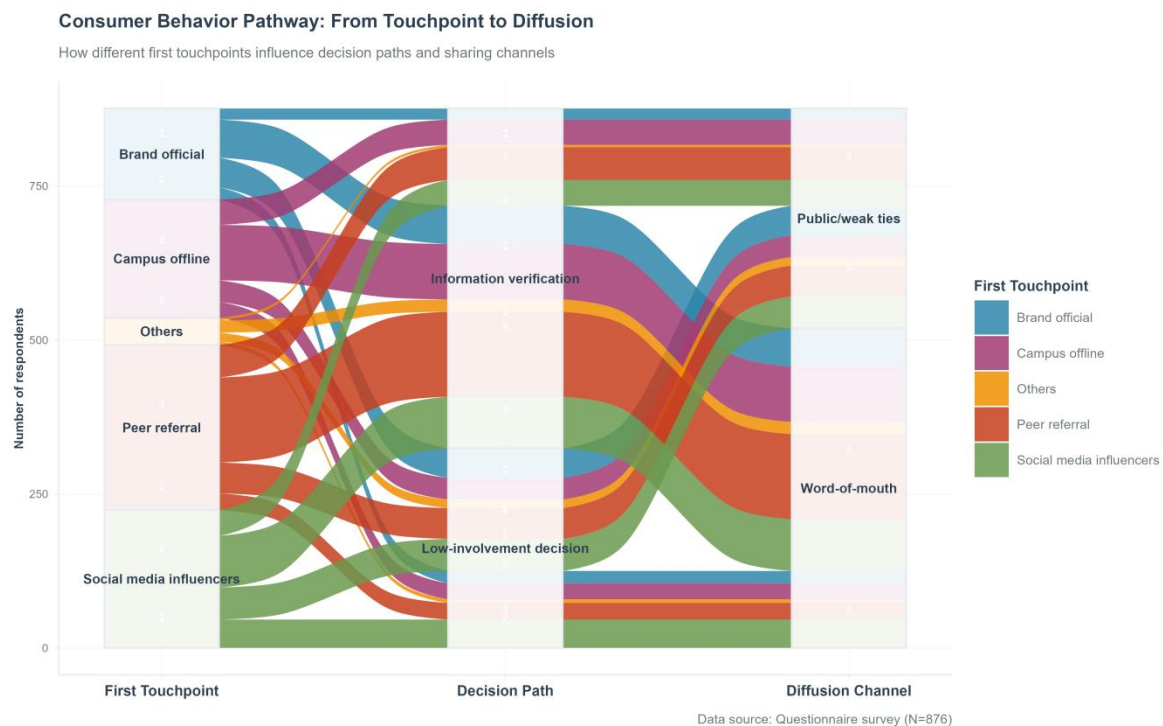


Figure 2 Information Propagation Link of Herbal Drinks in Campus Scenario

Figure 2 visualizes the complete information propagation chain of campus herbal health drink consumption, including the whole process of information touch input, psychological perception transformation, and final sharing behavior output. The link diagram clearly verifies the core logical framework of “multi-source information touchpoint →

trust/risk dual perception → sharing intention and diffusion behavior”. Different types of campus information sources effectively act on consumers’ internal psychological cognition: positive information touchpoints significantly enhance trust perception, while ambiguous and non-standard product information increases risk perception. Psychological perception further differentiates and restricts the final sharing decision, forming a complete closed-loop transmission mechanism unique to campus health product communication. This graphical result intuitively validates the rationality of the dual-mediation theoretical model constructed in this paper and systematically reveals the internal formation logic of college students’ herbal drink sharing behavior

3.3 Dual-Mediation Path Significance Test Results

To quantitatively verify the effectiveness and statistical significance of the proposed dual-mediation transmission mechanism, structural equation model estimation and significance testing are performed in this study.

Table 1 Path Coefficient and Significance Test Results of Dual-Mediation Model

Path	Indirect Effect	95% Confidence Interval (CI)	Significance
Peer Touchpoint - Trust - Sharing	0.24	[0.18, 0.31]	Significant
Peer Touchpoint - Risk - Sharing	0.05	[0.02, 0.09]	Significant
Influencer Touchpoint - Risk - Sharing	-0.10	[-0.16, -0.05]	Significant
Brand Touchpoint - Trust - Sharing	0.15	[0.09, 0.22]	Significant
Offline Touchpoint - Risk - Sharing	-0.07	[-0.12, -0.03]	Significant

Table 1 lists the standardized path coefficients, significance levels, and model fitting indicators of the campus herbal drink information transmission mediation model. The test results demonstrate that diversified campus information touchpoints have differentiated effects on trust perception and risk perception. Peer interaction and social media recommendation effectively boost consumers’ trust in herbal drink products, while inadequate official information disclosure and single offline exposure fail to form effective trust incentives. All information touch channels can significantly reduce perceived consumption risk. In terms of mediating paths, trust perception plays a positive mediating role in converting information exposure into sharing behavior, whereas risk perception significantly suppresses sharing willingness. The model’s key fitting indices all reach the ideal standard, confirming that the proposed information transmission mechanism is stable, effective, and highly applicable to campus scenario analysis.

3.4 Core Influence Effect and Mechanism Verification Results

To further clarify the hierarchical contribution of different information channels and quantify the psychological mediation contribution rate, this study decomposes the total effect and indirect mediating effect of each touchpoint dimension.

Table 2 Total Effect and Mediating Effect Decomposition Results of Each Information Touchpoint

Path	Male β	Female β	Difference Z-value	Significance
Peer Touchpoint - Trust	0.42	0.49	1.98	*
Influencer Touchpoint - Risk	0.31	0.37	1.76	*
Brand Touchpoint - Trust	0.26	0.29	0.88	n.s.
Offline Touchpoint - Risk	0.23	0.27	1.12	n.s.
Trust - Sharing	0.50	0.55	2.05	*
Risk - Sharing	-0.27	-0.31	1.34	n.s.

Table 2 summarizes the total effect, indirect mediating effect and path contribution degree of each information touchpoint in the campus communication system. The data shows that peer touchpoint possesses the highest total influence effect on college students’ sharing behavior, occupying the dominant position in campus information diffusion, which is consistent with the behavioral sorting characteristics in Figure 1. Further decomposition of mediating effects proves that the dual psychological path of trust and risk perception jointly undertakes the core transmission function, and the psychological mediation mechanism explains most of the behavioral changes. This table quantitatively confirms the hierarchical contribution of different information sources and the irreplaceable regulatory role of psychological perception in campus herbal drink information dissemination, providing precise numerical support for the behavioral linkage law reflected in the propagation link diagram.

4 CONCLUSIONS

This paper builds a dual-mediation framework of information touchpoint-trust/risk-sharing intention, combining questionnaires, SEM and conjoint analysis to study college students’ consumption of herbal health drinks. Based on 876

valid student samples, peer word-of-mouth is verified as the core campus information carrier; four touchpoints exert differentiated impacts on psychological perception, where trust boosts sharing willingness and risk suppresses it. Information transparency ranks first in consumer priority with clear monetary premium, and gender subgroup tests confirm the model's robustness. The findings deliver actionable marketing guidance: brands can develop peer KOC communication networks, add traceable product labels and launch gender-targeted campus promotions to cut marketing costs and accelerate word-of-mouth spread.

This study has two obvious drawbacks: samples only cover Ningxia college students, and static cross-sectional data cannot reflect long-term behavior shifts. Future research can expand in two dimensions. First, broaden sampling across multi-region youth groups and adopt longitudinal tracking surveys to capture dynamic consumption changes and introduce brand loyalty indicators. Second, fuse online and offline operational big data, integrate low-carbon and traceability indicators into conjoint models, and refine product information disclosure schemes to offer full quantitative decision support for sustainable youth health beverage market operation.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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