A Study on the Mechanism of Sensory Marketing's Impact on Customer Loyalty in Experiential Retail Settings

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Abstract The rapid development of e-commerce has brought great opportunities for experiential retailing practices, but also faces the challenge of sustainable development. Under the background of experiential retailing, this paper constructs a model of the influence of sensory marketing on customer loyalty from the three dimensions of sensory marketing, brand relationship quality and customer loyalty, and constructs a structural equation model based on the partial least squares method, and selects enterprise A, which mainly engages in coffee products, as the research object, to investigate the influence mechanism of sensory marketing on customer loyalty by the method of questionnaire data analysis. The results of the study show that among the four dimensions of sensory marketing, only action experience can directly have a positive effect on customer loyalty, while the three dimensions of sensory experience, emotional experience and thinking experience can indirectly have a positive effect on customer loyalty by having a significant positive effect on brand relationship quality. When brand relationship quality is introduced, the influence of sensory marketing on customer loyalty decreases, verifying the mediating role of brand relationship quality between sensory marketing and customer loyalty. The research in this paper makes a theoretical foundation for marketing strategies such as enhancing customer loyalty and customer sensory experience, and suggests managers to market corporate brands from the perspective of senses such as sight, smell and taste.

Index Terms Partial Least Squares, Structural Equation Modeling, Customer Loyalty, Brand Relationship Quality

I. Introduction

A retail store is a place of business where merchants sell goods to consumers, usually in small quantities or in single units [1]. Different from the wholesale business of bulk goods, its main feature is to sell in small quantities, but in terms of price may be more expensive than wholesale. With the increasingly fierce competition in the market, the development of retail stores has been hampered by certain obstacles, such as product sameness, unstandardized market segmentation, lack of brand advantage, and the prevalence of low-priced competition [2], [3].

Nowadays, the competition in retail stores is not only limited to products and services, but shifted to the competition for consumers [4]. Companies want to attract as many new customers as possible while retaining the existing ones, so they have to come up with some novel marketing programs or strategies [5], [6]. Sensory marketing, which is a marketing approach that incorporates the five sensory experiences of consumers and thus influences their perceptions, judgments, and behaviors, is a rapidly developing research area in marketing in recent years [7]. In the process of commercial marketing, the retail industry utilizes the five senses of human eyes, ears, nose, tongue and body to carry out experiential emotional marketing, shaping the sensory experience and emotional resonance of consumers and creating a new marketing model of brand-new experience for consumers [8]-[11]. This new marketing model can not only bring consumers a new experience different from the past, but also stimulate consumers' desire to buy, thus generating purchasing behavior [12]-[14]. By studying the relationship between sensory marketing and customer loyalty in the experiential retail environment, we have made predictive suggestions for the future wide application of sensory marketing mode.

A large number of scholars have explored the ways in which sensory marketing strategies can be applied in retail environments, as well as analyzing the strengths and roles of the strategy. Shahid, S. et al. examined the impact of sensory marketing cues and brand experiences in retail stores on consumers' emotional attachment and subsequent brand loyalty, noting that there is a higher degree of interaction, and that it is expressed more strongly in luxury retail stores [15]. Biswas, D. showed that environmental factors such as smells, lights and music in offline retail stores provide ideas for the optimization of sensory marketing methods by influencing consumers' sensory experience, which in turn affects their shopping experience and consumption behaviors, and by describing the specific paths of influence of different sensory elements on retail practices [16]. Lick, E. constructed a multimodal

sensory marketing framework for retail stores to provide theoretical references for further integration of sensory modalities to enhance consumer behavior by analyzing the role of transduction within and between modalities [17]. Abdolmohamad Sagha, M. et al. pointed out that sensory cues and product sensory stimuli in retail stores will effectively influence consumers' emotions, purchase intentions and experiences, and facilitated the implementation of sensory marketing strategies in retail stores by analyzing the interactions between different sensory modalities and consumers [18]. Géci, A. et al. analyzed the involvement of sensory elements in the process of consumer purchase of products and services, emphasizing that vision is the most direct factor influencing consumer shopping behavior [19]. Nghiêm-Phú, B. extends the shopping environment theory to outdoor marketing environments, stating that while visual sensory cues play an active role in the marketing strategies of individual retail stores, for the outdoor marketing environment of an entire shopping street, it is necessary to incorporate a variety of sensory modalities such as visual, auditory, and tactile [20]. Viegas, C. explored multisensory stimulation marketing strategies in retail environments, advancing research on the consistency of multisensory stimulation by identifying the impact of specific sensory elements on consumer shopping behaviors in order to further enhance the effectiveness of sensory marketing in retail environments [21]. In summary, the application of sensory marketing strategies such as audio-visual experience in retail stores can largely attract more consumers to experience the products or services, thus promoting the repeat purchase behavior and willingness of consumers, showing high consumer loyalty, and providing new ideas for the innovation of marketing mode in the physical retail industry.

In this paper, sensory marketing is divided into four dimensions: sensory experience, emotional experience, thinking experience and action experience, and two variables, customer loyalty, and brand relationship quality, are introduced. The structural equation model was constructed by choosing the partial least squares method that can handle small sample data. Then the questionnaire survey and data statistics were used to select Enterprise A and customers with consumption experience related to Enterprise A as the research objects. The influence mechanism of the independent variable of sensory marketing on the dependent variable of customer loyalty is explored, and the mediating effect of brand relationship quality in the influence mechanism is also explored.

II. Relevant theories and research hypotheses

II. A. Connotation of experiential retailing

Experiential retailing was first proposed as part of the "Five New Strategies". The change of experiential retailing is different from the previous retail revolution, focusing not only on the reduction of costs and the number of people, but also through the depth of the combination of big data and business logic, to realize the reverse influence of consumers on the retail enterprise, and emphasize more on the important role of consumers' own needs to drive the enterprise's products and services, which is a change of retailing method. It emphasizes more on the important role of consumers' own demand to drive the enterprise's products and services, and is a kind of change of retailing mode.

Experiential retailing is a business model that integrates online sales channels, offline stores and logistics services with the help of cutting-edge Internet technology to build an omni-channel retail environment. From the multi-dimensional perspectives of consumers, technology, value and industry, retail digitization is defined as a data-driven retail ecosystem centered on consumer demand. The "newness" of experiential retailing is mainly reflected in the advanced science and technology, through the application of advanced Internet thinking and intelligent science and technology, to innovate and improve the whole activity of traditional retailing, focusing on the construction of advanced infrastructure.

II. B. Sensory marketing

The arrival of the experience economy has made enterprises pay more attention to the quality of the experience service programs provided to consumers, which has become an important aspect of enterprises to improve their competitive advantage. Experience economy is a kind of service program consciously provided by enterprises, and it is a process to make consumers participate in it to obtain cognition. Sensory marketing constitutes a new way of marketing interaction by stimulating consumers' senses and emotions, thus stimulating their actions and thoughts. In this paper, from the perspective of enterprises, we believe that sensory marketing refers to a kind of marketing method that makes customers think in the process of consumption by fully mobilizing and stimulating consumers' sensibility and rationality, such as sensation, emotion, thinking, action, association and other sensibility factors.

The division of sensory marketing dimensions is based on the definition of different sensory marketing concepts. Experiential retail sensory marketing is divided into sensory experience, emotional experience, thinking experience and action experience. Among them, sensory experience is the sensory stimulation of sight, hearing, smell, taste, touch and other sensory stimuli through the actual experience of customers to form the perception of things. Emotional experience is the emotional resonance and recognition between customers and the brand. Thinking

experience is through the experience of the project to arouse the interest and attention of customers, the process of stimulating customers to think independently, the formation of cognitive process. Action experience is through the consumption experience, the customer's way of doing things, lifestyle, life philosophy and other impact on the process.

II. C. Sensory Marketing and Customer Loyalty

As the importance of sensory marketing in consumer behavior gradually deepens, scholars at home and abroad have conducted certain studies on the relationship between sensory marketing and customer loyalty. Sensory marketing has been studied in four dimensions: sensory experience, thinking experience, emotional experience and association experience, of which emotional experience and association experience directly and positively affect customer loyalty, while sensory experience and thinking experience indirectly affect customer loyalty through brand cognition. In different research contexts, the direct effect of different dimensions of sensory marketing on customer loyalty is not consistent, but most of them have a positive and significant effect on customer loyalty through mediating variables. Under the background of experiential retailing, sensory marketing is developing in the direction of more intelligent and personalized, and the use of big data technology and smarter infrastructure has made innovations and improvements on the basis of traditional retailing, expanding the content and methods of sensory marketing. Based on this, the following hypotheses are proposed.

H1: Sensory marketing in the context of experiential retailing has a significant positive effect on customer loyalty.

H1a: Sensory experience has a significant positive effect on customer loyalty.

H1b: Emotional experience has a significant positive effect on customer loyalty.

H1c: Thinking experience has a significant positive effect on customer loyalty.

H1d: Action experience has a significant positive effect on customer loyalty.

II. D. Sensory Marketing and Brand Relationship Quality

Brand relationship refers to the interactive relationship between brand and consumer, which is accumulated through consumption experience. Relationship quality in the narrow sense refers to the connection between brand and consumer, specifically the interaction between these two types of actors. In the broader sense, brand relationship quality refers to the relationship between the brand and the consumer with the addition of more related subjects, including suppliers, shareholders, media, government, financial institutions and other brand stakeholders. In this paper, we adopt a narrow understanding of brand relationship, which refers to the interactive relationship between consumers and brands.

Strengthening the brand experience can significantly enhance the solidity of the relationship between customers and the brand, which in turn can increase customers' trust in the brand, promote positive word-of-mouth, and stimulate the willingness to co-create value. The quality of sensory marketing has a positive effect on brand leadership and the quality of mythical brand relationships. In the context of experiential retailing, the essence of relationship management between brands and customers remains unchanged. With the support of technological innovation, companies use big data analysis as a tool to optimize brand relationship management, so that they can provide consumers with more accurate and flexible sensory marketing services and create a healthier brand relationship. Based on this, the following hypotheses are proposed.

H2: Sensory marketing has a significant positive effect on brand relationship quality in experiential retailing.

H2a: Sensory experience has a significant positive effect on brand relationship quality.

H2b: Emotional experience has a significant positive effect on brand relationship quality.

H2c: Thinking experience has a significant positive effect on brand relationship quality.

H2d: Action experience has a significant positive effect on brand relationship quality.

II. E. Brand relationship quality and customer loyalty

Relationship quality is a key indicator of the effectiveness of interactions between an organization and its stakeholders. Brand relationship quality and brand experience as perceived by customers have a significant positive impact on brand satisfaction and loyalty, emphasizing the centrality of sensory marketing and brand relationship quality in shaping brand loyalty. Brand relationship quality can be subdivided into three dimensions: trust, satisfaction and commitment, each of which has a significant positive impact on brand loyalty. Based on the above analysis, the following hypotheses are proposed.

H3: Brand relationship quality has a significant positive effect on customer loyalty.

H4: Brand relationship quality has a mediating role between sensory marketing and customer loyalty [22].

Based on the above analysis and research hypotheses, the conceptual model is formed as shown in Figure 1.
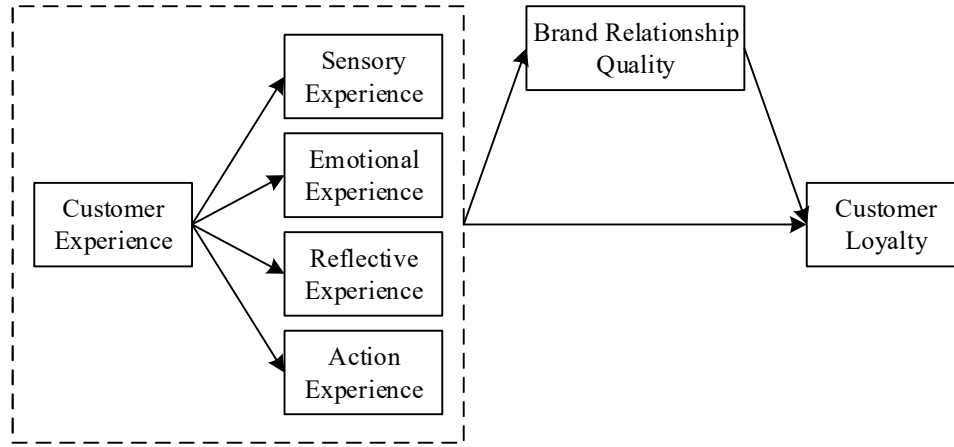
Figure 1: Conceptual model

III. Structural equation modeling and PLS algorithms

In this section, the theory related to structural equation modeling is further explored, starting with an introduction to the basic theory of structural equation modeling, followed by an introduction to the solution methods of structural equation modeling.

III. A. Fundamental Principles of Structural Equation Modeling

From the perspective of variables, SEM has two pairs of variables, namely latent and manifest variables, endogenous and exogenous variables. Exogenous variables only affect other variables without being affected by them, while endogenous variables are subject to the influence of explanatory variables.

SEM consists of two parts: measurement model and structural model. The former analyzes the relationship between latent variables that are not directly observable and the corresponding explicit variables that are directly measurable, while the latter analyzes the interactions between latent variables.

The expression of the measurement model is:

$$X = \Lambda_x \xi + \delta \tag{1}$$

$$Y = \Lambda_y \eta + \varepsilon \tag{2}$$

Among them:

$X = (x_1, x_2, \cdots, x_q)^T$: vector of exogenous explicit variables constituting $(q \times 1)$.

$Y = (y_1, y_2, \cdots, y_p)^T$: vector $(p \times 1)$ composed of endogenous explicit variables.

Λ_x : matrix of regression coefficients of X on ξ, reflecting the relationship between exogenous explicit variables and exogenous latent variables $q \times n$.

Λ_y : matrix of regression coefficients of Y on η, reflecting the relationship between endogenous explicit variables and endogenous latent variables.

$\xi = (\xi_1, \xi_2, \cdots, \xi_n)^T$: a vector of exogenous latent variables constituting $(n \times 1)$.

$\eta = (\eta_1, \eta_2, \cdots, \eta_m)^T$: vector of exogenous latent variables constituting $(m \times 1)$.

$\delta = (\delta_1, \delta_2, \cdots, \delta_q)^T$: vector $(q \times 1)$ consisting of measurement errors of exogenous explicit variables X.

$\varepsilon = (\varepsilon_1, \varepsilon_2, \cdots, \varepsilon_p)^T$: the vector $(p \times 1)$ constituted by the measurement errors of the endogenous explicit variable Y.

The expression for the structural model is:

$$\eta = B\eta + \Gamma\xi + \varsigma \tag{3}$$

where, B : represents the matrix of regression coefficients between endogenous latent variables $(m \times m)$, Γ : represents the matrix of regression coefficients between exogenous and endogenous latent variables $(m \times n)$, ς : a vector representing the composition of residual terms of the structural equations in the model $(m \times 1)$.

The above calculations are based on the assumptions that $E(\delta) = 0$, $E(\varepsilon) = 0$, $E(\varsigma) = 0$, ε is uncorrelated with η and ξ, δ is uncorrelated with η and ξ, ε is uncorrelated with δ is uncorrelated, and ς is uncorrelated with ξ, ε, and δ. There are 8 parameter matrices in SEM: Λ_x, Λ_y, B, Γ, Φ, Ψ, Θ_ε, Θ_δ, and satisfied:

$$Cov(\xi) = \Phi(n \times n) \tag{4}$$

$$Cov(\varsigma) = \Psi(m \times m) \tag{5}$$

$$Cov(\varepsilon) = \Theta_\varepsilon(p \times p) \tag{6}$$

$$Cov(\delta) = \Theta_\delta(q \times q) \tag{7}$$

The variance-covariance matrix of vector $Z = (Y', X')$ can be obtained from the measurement equation as:

$$\Sigma = \begin{bmatrix} \Lambda_y A(\Gamma\Phi\Gamma' + \Psi)A'\Lambda_y' + \Theta_\varepsilon & \Lambda_y A\Gamma\Phi\Lambda_x' \\ \Lambda_x \Phi\Gamma'A'\Lambda_y' & \Lambda_x\Gamma\Lambda_x' + \Theta_\delta \end{bmatrix} \tag{8}$$

$A = (I - B)^{-1}$, and Φ, Ψ, Θ_ε, Θ_δ are the covariance matrices of ξ, ς, ε, and δ, respectively.

The most basic assumption of structural equation modeling [23] is that $\Sigma = \Sigma(\theta)$, and if the theoretical model is true, then $\Sigma(\theta)$ is equal to the overall covariance matrix (θ is the model parameter vector), and the variances and covariances of the explicit variables are functions of the model parameters.

III. B. Solving the structural equation model

The specific construction steps for structural equation modeling are:
(1) Preliminary setting of model variables and paths;
(2) Selection of appropriate modeling techniques according to the research object;
(3) Identification of the model;
(4) Parameter calculation;
(5) Evaluating whether the model passes the test;
(6) Modifying the model;
(7) Determining the model.

Among the two common methods in this step of modeling technique selection are the covariance structural analysis (LISREL, also known as AMOS method) and the partial least squares (PLS) method [24]. These two methods have different characteristics, different processes and different applications, and the corresponding method should be selected in conjunction with the research problem when used specifically. The process of structural equation modeling is shown in Figure 2.

Among them, in terms of analytical objectives, the LISREL method originates from model parameter estimation, the PLS algorithm originates from prediction, the basic calculation of the LISREL method is based on covariance, the calculation of the PLS algorithm is based on variation, the PLS algorithm does not have the step of model identification, and the requirements for parameter estimation are not as strict as those of LISREL.

In summary, the PLS algorithm has many advantages over the LISREL method, such as not needing to prejudge whether the data obeys a normal distribution before solving, as well as being able to deal with small samples or small-medium size sample data. Therefore, in the research of the thesis, it was decided to use the PLS algorithm for the solution of structural equation modeling.

III. C. Structural equation modeling based on PLS algorithm

(1) Principle of PLS structural equation modeling

The basic idea of the PLS algorithm is to have p dependent variable y, denoted as $(y_1, y_2, \cdots, y_p)^T$, and q independent variable x, denoted as $(x_1, x_2, \cdots, x_q)^T$, which correspond to the endogenous and exogenous explicit variables, respectively, and a total of n sample points are observed in structural equation modeling. The components η_1 and ξ_1 are extracted from the variables $(y_1, y_2, \cdots, y_p)^T$ and $(x_1, x_2, \cdots, x_q)^T$, respectively, which

are the linear combinations of the corresponding sets of variables, and they should contain as much information as possible about the variability in the corresponding data tables and the degree of correlation of the two components should be maximized. The two components should contain as much variance information as possible in the corresponding data table and the correlation between them should be maximized.

When the first component η_1 and ξ_1 are extracted, regression analysis of X on ξ_1 and Y on η_1 are performed respectively.
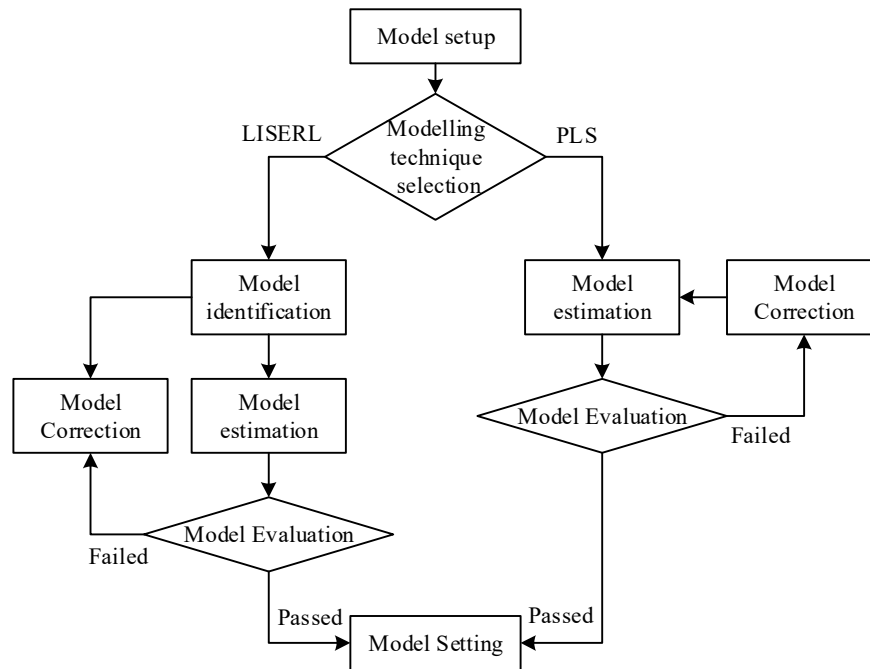

Figure 2: Structure equation model construction process

The structural equation model is shown in Figure 3, the model is divided into two parts, the exogenous latent variable ξ and the endogenous latent variable η, there is a unidirectional influence relationship between the two latent variables, the exogenous latent variable influences the endogenous latent variable, the exogenous latent variable is the explanatory variable, the endogenous latent variable is the explanatory variable, in addition to the ξ has a major influence on η, the residual term ς also has an effect on η. In the model, each latent variable has its own corresponding manifest variable, the exogenous latent variable ξ corresponds to the exogenous manifest variables x_1 and x_2, and the endogenous latent variable corresponds to the endogenous manifest variables y_1 and y_2, which can not be obtained directly, but are obtained from the measurement of the corresponding manifest variables.
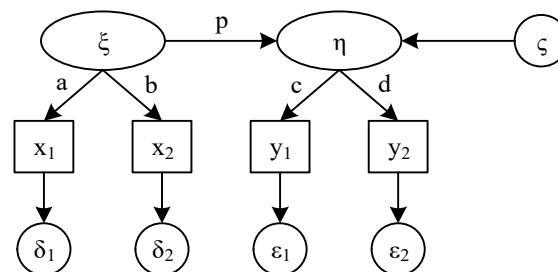

Figure 3: Model elements of the equation of structure equation

The model parameters a, b, c, d as well as the path coefficients p and the residual term ς need to be estimated based on the samples.The parameter estimation of PLS-SEM is based on the reduction of the variance of the residuals of the dependent variable (i.e., endogenous latent variables), which is evaluated based on its explicit weighted sum for the latent variable components, since the latent variables are represented by the corresponding explicit variables. The scores of the components of ξ are generated based on x_1 and x_2 to make them better predictors of η, and the weights are calculated for y_1 and y_2 to make them better predictors of η and to make η effectively explained by ξ.

In the calculation process, each variable is given the same initial weight before iteration, and each subsequent iteration considers the latent variable variance as the unit variance to compute the new weights, which is a process of external approximation. The completion of the external approximation process will result in a proxy relationship between each latent variable and the other hypothesized related latent variables to obtain a proxy estimate.

(2) Estimation and Testing Criteria

The test of PLS structural equation modeling generally includes the unique dimension test, confidence, validity test and significance test of path coefficients. The unique dimension test is to ensure the uniqueness of the latent variables corresponding to each set of explicit variables, which is judged using the eigenvalues calculated by principal component analysis. Reliability, containing internal consistency reliability and synthetic reliability, the former uses Cronbach's alpha coefficient as a test index, generally requiring greater than 0.6 or 0.7, and the latter generally adopts CR as a test index, generally requiring a CR value greater than 0.7.

Table 1: The validity test of each influence factor

Influencing factor	Index name	Cronbach'sα	Load normalization coefficient
Sensory experience	A1	0.849	0.827
	A2		0.818
	A3		0.817
	A4		0.840
Emotional experience	B1	0.774	0.752
	B2		0.773
	B3		0.773
	B4		0.804
Thinking experience	C1	0.768	0.773
	C2		0.629
	C3		0.749
	C4		0.761
Action experience	D1	0.781	0.719
	D2		0.792
	D3		0.843
	D4		0.784
Brand relationship quality	E1	0.754	0.733
	E2		0.760
	E3		0.828
	E4		0.761
Customer loyalty	F1	0.811	0.739
	F2		0.699
	F3		0.750
	F4		0.878

IV. Scale design and statistical analysis of data

IV. A. Scale Design and Reliability and Validity Tests

In order to verify the conceptual research model of enterprise customer loyalty constructed and hypothesized earlier, the questionnaire adopts Likert's 1-5 scale, and the content of the questionnaire mainly includes the influence of sensory experience, emotional experience, thinking experience, action experience and brand relationship quality and other influencing factors on enterprise customer loyalty. The target of the survey is enterprise A, which mainly deals with coffee products, and the distribution of the questionnaire is mainly based on the online distribution of the

questionnaire on the Internet, supplemented by the offline distribution of the questionnaire to unfamiliar passers-by. In order to guarantee the validity of the questionnaire, the respondents are required to have the consumption experience of purchasing coffee products of enterprise A. The survey will be conducted in 2022. The questionnaire survey was conducted from October 30, 2022 to November 13, 2022, and the target respondents were mainly college teachers, staff of enterprises and institutions, and students. A total of 250 questionnaires were collected in this survey, among which 250 questionnaires were valid and 0 questionnaires were invalid, and the validity rate of questionnaire recovery was 100%.

The reliability of the questionnaire was analyzed with the help of SPSS20.0 statistical analysis software, and the results of the reliability test of each influential factor are shown in Table 1, and the Cronbach'α coefficient of each influential factor is more than 0.7, which indicates that the measurement items of these variables are relatively well-designed, and it can be seen that there is a correlation between the variables, which is suitable for the factor analysis. In order to test the measurement validity, further validation factor analysis was conducted on the influencing factors, and the results showed that the load standardized coefficients of each influencing factor exceeded 0.6 and were significant at the p < 0.001 level, indicating that the convergent validity of each influencing factor was better.

IV. B. Correlation analysis

In this study, Pearson's coefficient was used to measure the correlation between the variables and to test whether there is a correlation between the variables and customer loyalty. There should not be a high level of covariance problem between the respective variables, otherwise it will affect the later analysis. The correlation coefficient of the two independent variables should generally not be greater than 0.50, and if it reaches 0.8, it indicates a high level of covariance problem. The correlation coefficients of the variables are summarized in Table 2, and the correlation coefficients between the independent variables are lower than 0.80, which indicates that there is basically no covariance problem between each independent variable, and they are significantly correlated at the level of $p < 0.01$, ** indicates the significance level of $p < 0.01$.

Table 2: The correlation coefficients of each variable are summarized

Variable	Sensory experience	Emotional experience	Thinking experience	Action experience	Brand relationship quality	Customer loyalty
Sensory experience	1					
Emotional experience	0.512**	1				
Thinking experience	0.508**	0.544**	1			
Action experience	0.361**	0.461**	0.411**	1		
Brand relationship quality	0.384**	0.403**	0.438**	0.573**	1	
Customer loyalty	0.505**	0.564**	0.621**	0.546**	0.553**	1

IV. C. Model and data fitting

This part requires importing the SPSS data table of the questionnaire into AMOS software for calculation, and the output results show that the indicators perform well, as shown in Table 3. The most important judging index is the chi-square degrees of freedom, whose evaluation standard is less than 3, and the output result is 1.595, which meets the standard, and the fit is judged to be ideal.The *RMSEA* evaluation standard is less than 0.08, and the output result is 0.045, which meets the standard, indicating that the fit is good.The values of the value-added fit indexes of the *GFI*, *NFI*, and *CFI* are respectively 0.911, 0.940, and 0.977, which are all greater than 0.9 required by the evaluation criteria, meeting the fitness standard. *PNFI* and *PGFI* are also much greater than 0.5, respectively, 0.795 and 0.701, meeting the fitness standard, indicating that the model has good fitness.

Table 3: Model fitting index

Index	Absolute fitting			Appreciation fitting			Contracted fitting	
	x^2/DF	P	RMSEA	GFI	NFI	CFI	PNFI	PGFI
Evaluation criteria	<3	<0.1	<0.08	>0.9	>0.9	>0.9	>0.5	>0.5
Output result	1.595	0	0.045	0.911	0.940	0.977	0.795	0.701
Suitability	ideal	ideal	ideal	ideal	ideal	ideal	ideal	ideal

The model path coefficients are shown in Table 4. The P-value of sensory experience on brand relationship quality is less than 0.01 with an unstandardized coefficient of 0.306, and the P-value of emotional experience and action experience on brand relationship quality is also less than 0.05, which indicates that the three factors of emotional

experience, action experience, and sensory experience have a positive influence on brand relationship quality. The P-value of brand relationship quality on customer loyalty is less than 0.01 with an unstandardized coefficient of 0.477, and the P-value of action experience on customer loyalty is also less than 0.01, which suggests that the 2 factors of brand relationship quality and action experience have a positive influence on customer loyalty. Therefore, the hypotheses H2a, H2b, H2d, H3 and H1d of this paper are valid.

Table 4: Model path coefficient

Path relation	Standardized estimate	Nonstandardized estimate	Standard error	P
Sensory experience → brand relationship quality	0.302	0.306	0.075	***
Emotional experience → brand relationship quality	0.355	0.392	0.078	**
Action experience → brand relationship quality	0.211	0.275	0.085	*
Thinking experience → brand relationship quality	0.095	0.091	0.066	0.365
Brand relationship quality → customer loyalty	0.475	0.477	0.098	***
Action experience, customer loyalty	0.533	0.536	0.056	***
Sensory experience, customer loyalty	-0.185	-0.189	0.059	0.055
Emotional experience, customer loyalty	0.344	0.348	0.043	0.811
Thinking experience, customer loyalty	0.082	0.085	0.062	0.435

IV. D. Test of mediating effects of brand relationship quality

The mediation model of brand relationship quality is based on the basic model, adding the mediating role of the variable of brand relationship quality, and the test results are shown in Table 5. In the mediation model, sensory marketing has a significant positive effect on customer loyalty ($\beta=0.85$, $p<0.01$), brand relationship quality has a significant positive effect on customer loyalty ($\beta=0.89$, $p<0.01$), and sensory marketing has a significant indirect effect on customer loyalty ($\beta=0.55*0.89=0.49$, $p<0.01$), and at the same time, compared to the basic model, the effect of sensory marketing on customer loyalty became significantly smaller after the introduction of mediating variables ($\beta=0.66$, $p<0.01$), therefore, the brand relationship quality has a mediating role between sensory marketing and customer loyalty was verified, and the hypothesis H4 was established.

Table 5: Intermediate model test

Influence path	Basic model coefficient	Mediation model coefficient
Sensory marketing → Customer loyalty	0.85**	0.66**
Sensory marketing → Brand relationship quality		0.55**
Brand relationship quality → Customer loyalty		0.89**
SRMR	0.031	0.052

V. Conclusion

This paper applies structural equation modeling based on PLS algorithm to explore the impact of sensory marketing on customer loyalty and draws the following conclusions based on the results of empirical analysis.

(1) The direct impact of sensory marketing's sensory experience, emotional experience and affective experience dimensions on customer loyalty is not significant, but it will have an indirect impact on customer loyalty through the quality of brand relationship. Action experience is compared to other sensory marketing on the customer's impression of the impact of a more vivid image, its unstandardized coefficient of 0.536, the customer loyalty of the p-value is also less than 0.01, so it is on the formation of customer loyalty has a significant positive impact.

(2) Action experience is the actual service experience in the process of interaction between consumers and brands. When the customer has a good experience when using the product, then it will increase the brand loyalty to the company. And good sensory experience helps to shape a positive brand image, beautiful visual elements will enhance the image of the brand in the minds of consumers, thus enhancing the brand quality relationship. Emotional experience, on the other hand, can establish a long-term emotional hub between consumers and the brand, forgiving minor problems that occur with the brand and maintaining a higher quality brand relationship. In many cases, consumers' purchasing decisions are rapid, and fast purchasing methods do not give consumers enough time to think deeply about the experience. Therefore, all sensory marketing dimensions other than the thought experience have a significant impact on brand relationship quality.

Based on the above conclusion, companies can optimize the brand's visual experience by starting with product detail design and packaging design. Design unique brand theme songs and language images to strengthen the brand's auditory experience. Enhance the brand's taste and smell experience and other aspects to increase the

brand's exposure and memory in the minds of consumers, in order to enhance consumer satisfaction with the brand, more willing to purchase the brand's products for long-term use, so as to complete the enhancement of brand loyalty.

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