



Sensory brand experience and brand loyalty: Mediators and gender differences

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ABSTRACT

Sensory brand experience is a fundamental and central brand experience. Its influencing mechanism on brand outcome variables still needs to be clarified. This study proposed a new SEM model to explore the influencing mechanism from sensory brand experience to brand loyalty and tested it using SmartPLS 4 software. Data were gathered through a web-based questionnaire survey of 304 Chinese consumers. The results show that sensory brand experience is vital in fostering brand loyalty. It impacts brand loyalty both directly and indirectly. The mediating effect of brand attitude is much higher than the mediating effect of brand-self connection, which means that in some situations, a strong emotional bond is not essential for brand success. The results also reveal the moderating effect of gender on relationships in the model. The key gender difference is that the male group does not have a mediation path through brand-self connection, while the female group has. This study expands the research on brand experience and sheds light on developing brand loyalty. Gender differences should be considered when developing sensory marketing strategies. Especially for women, creating sensory brand experiences that elicit strong emotional connections has positive effects on brand loyalty.

1. Introduction

Today, experience plays a large part in consumer behavior (Hwang & Lee, 2018). Modern consumers buy products and services not only for their functional features and benefits but also for the pleasant experiences they have from their purchases. Brand marketers constantly promote innovative ways to create exceptional brand experiences that strengthen the brand's beneficial relationship with consumers (Gilmore & Pine, 2007; Kim & Han, 2020). This fact highlights the importance of brand experience in the marketing and brand management literature.

Despite increasing research in this area, brand experience still needs to be explored as a relatively new brand phenomenon (Khan & Fatma, 2017). Brakus et al. classified brand experience into four aspects: sensory, affective, behavioral, and intellectual (Brakus et al., 2009). This multidimensional approach to brand experience has been widely adopted by academics (Chan & Tung, 2019; Yu et al., 2024). However, previous studies found that the four dimensions of brand experience tend to have quite different influences on brand outcome variables (Huseynov et al., 2020; Lin et al., 2023; Pina & Dias, 2021). Therefore, detailed studies on each of these dimensions are needed and will deepen our understanding of brand experience.

Sensory brand experience has attracted special attention from scholars due to its prominent influence on brand outcome variables. Results show that sensory brand experience influences key variables in customer-brand relationships (Zha, Foroudi, Jin, & Melewar, 2022; Zha, Foroudi, Melewar, & Jin, 2022). The sensory aspects of customer experience are central to brand competitiveness (Fürst et al., 2021; Hultén, 2011; Moreau, 2020). Thus, conceptualizing sensory brand experience (SBE) as an independent construct is critical to expanding our understanding of experiences provided by brands (Zha, Foroudi, Jin, & Melewar, 2022; Zha, Foroudi, Melewar, & Jin, 2022).

Based on the above considerations, this paper aims to focus on the influencing mechanism of sensory brand experience on brand loyalty. Two mediating variables are integrated into the model. One is brand attitude, the representative of general evaluation; another is brand-self connection, the representative of strong emotional bond. Since scholars debate whether a strong emotional connection is a necessary condition for brand success (Fritz et al., 2014; Park et al., 2013), simultaneously considering the role of both general evaluation and strong emotional connection in the context of exploring the impact of sensory brand experience on brand loyalty adds a fresh answer to this debate. Further, this study also explores the moderating role of gender

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on all relationships in the model, which is rare in the study of the impact of sensory brand experience on brand loyalty.

2. Theoretical background and hypothesis development

2.1. Theoretical background

2.1.1. Sensory brand experience

“Sensory brand experience” refers to the holistic and multisensory experience that customers have with a brand. It encompasses all the touchpoints and interactions that customers have with a brand, including visual, auditory, olfactory, gustatory, and tactile elements. It is at the heart of brand experience. Actual sensory activity impacts consumer behavior (Elder & Krishna, 2022). Therefore, sensory brand experience is fundamental to successful brand management and for scholars. Sensory brand experience is an emerging concept in marketing literature (Zha, Foroudi, Jin, & Melewar, 2022; Zha, Foroudi, Melewar, & Jin, 2022). It was first conceptualized and operationalized as a dimension of brand experience by Brakus et al. when discussing the concept, measurement, and impact of brand experience on loyalty (Brakus et al., 2009). Since then, many scholars have followed suit and incorporated sensory experience in their research on brand experience (Khan & Fatma, 2022; Urdea & Constantin, 2021). The importance of sensory brand experience in marketing strategy has led some scholars to study it as a stand-alone construct, exemplified by works such as Hultén’s paper on multisensory brand experiences (Hultén, 2011). Iglesias et al. and Hwang et al. further operationalized sensory brand experience within the brand equity framework (Hwang et al., 2021; Iglesias et al., 2011).

2.1.2. Brand attitude

Attitude is a kind of general evaluation based on beliefs or automatic emotional responses (Murphy & Zajonc, 1993). Brand attitude is the general assessment of an object and brand that is formed as a consistent opinion (Mitchell & Olson, 1981). Brand attitude is the psychological tendency of a consumer while evaluating the degree of liking of a brand. Consumers form brand evaluation through contact, purchase, and use of brands. Brand attitude has long been a central construct in consumer psychology. Marketers have long regarded brand attitude as an antecedent of consumer behavior.

2.1.3. Brand-self connection

Brand-self connection is defined as a strong emotional bond between a consumer and a brand as a consumer views a brand as part of himself (Dolbec & Chebat, 2013; Japutra et al., 2018; Park et al., 2010). Brand-self connection emphasizes a consumer’s sense of identity, belonging, or emotional attachment to a brand. It is more about the emotional aspect, exploring the emotional investment and attachment of consumers to brands. Park et al. regard brand-self connection as a component of brand attachment (Park et al., 2006; Park et al., 2010). The formation of brand-self connection is a long-term process.

2.1.4. Brand loyalty

Brand loyalty is a vital consumer behavior construct, a deep commitment to continuing repurchase or revisit a preferred product or service in the future, resulting in repeated purchases of the same brand or the same brand series (Oliver, 2010). In marketing literature, the term loyalty is often used interchangeably with its operational (measuring) definitions, such as repeat purchase intention and recommendation intention.

2.2. Hypothesis development

2.2.1. Effects of sensory brand experience on brand attitude

Brand attitude deals with general evaluative judgments toward a brand. Consumers form judgments toward the brand based on their

experiences with different brand clues. Brand experience influences brand attitude (Chang & Chieng, 2006; Shamim & Butt, 2013), and there is a significant positive correlation between brand experience and brand attitude (Dolbec & Chebat, 2013). The more positive the brand experience, the more positive the brand attitude (Brakus et al., 2009; Kozinets et al., 2002). Pleasurable brand experiences positively influence brand attitude (Grace & O’Cass, 2004; Zarantonello & Schmitt, 2013). Studies prove that sensory brand experience plays a central role in building consumers’ attitudes toward brands (Cleff et al., 2014; Jhamb et al., 2020). Sensory brand experience positively affects brand attitude (Hwang et al., 2021).

H1. Sensory brand experience positively affects brand attitude.

2.2.2. Effects of sensory brand experience on brand-self connection

Brand experience can create a strong emotional bond between customers and brands (Chinomona, 2013). A memorable or unique brand experience will make consumers feel a sense of belonging to the brand and strengthen their self-connection with the brand, thereby promoting brand-self connection. Sensory experiences are critical antecedents of visitors’ bond and identification with a destination. Visitors’ positive destination-related sensory experiences increase their dependence on and identification with the destination (Ai et al., 2022). A positive sensory experience will lead to a higher level of brand relationship (Hwang et al., 2021).

H2. Sensory brand experience positively affects brand-self connection.

2.2.3. Effects of brand attitude on brand loyalty

Human attitudes have important influences and predictive effects on behavioral willingness (Ha, 1998). Brand attitude is a sign that consumers like or dislike a brand. Measuring consumers’ brand attitudes is important because it can predict their brand choices and willingness to behave (Kim & Thorndike Pysarchik, 2000). When consumers make purchasing decisions, they refer to their brand tendencies; therefore, brand attitudes determine their decisions. Brand attitude significantly correlates with consumers’ purchase intention (Wu & Wang, 2014). A positive brand attitude can increase consumers’ willingness to buy. Brand attitude positively affects brand loyalty (Bozbay et al., 2018; Burton et al., 1998; Kim et al., 2019).

H3. Brand attitude positively affects brand loyalty.

2.2.4. Effects of brand-self connection on brand loyalty

Brand-self connection plays a crucial role in establishing a strong relationship between consumers and brands. The strength of this emotional connection determines whether consumers are willing to allocate their resources (such as time, money, etc.) to the corresponding brand (Park et al., 2006). Since purchasing behavior is governed by self-awareness, most scholars believe that self-concept impacts consumers’ purchasing behavior. Consumers prefer brands that express their self-concept when making purchasing decisions (Sirgy et al., 2000). A strong cognitive and emotional bond between consumers and brands induces customers to have positive intentions for a brand, and this type of attachment significantly increases loyalty (Jang, 2021).

H4. Brand-self connection positively affects brand loyalty.

2.2.5. Effects of sensory brand experience on brand loyalty

Brand experience is essential in creating brand loyalty (Iglesias et al., 2011; Ishida & Taylor, 2012; Kastenholtz, 2004). Consumers with a unique and impressive brand experience are more willing to repeat purchases to generate brand loyalty. Brand experience is a better predictor of consumers’ actual intentions (Brakus et al., 2009). A delightful brand experience helps build brand loyalty (Khan & Rahman, 2015). There is a significant positive correlation between brand experience and consumer purchase intention (Gabisch, 2011). Brand experience directly positively influences brand loyalty (Al-Awadi, 2002; Sahin et al., 2011;

Sumino & Harada, 2004).

Sensory brand experience has a positive impact on brand loyalty (Beig & Nika, 2022; Hwang et al., 2021). Sensory experience has positive effects on both WPM (Willingness to pay more) and RI (Repurchase intentions) (Ong et al., 2018). The sensory dimension of destination brand experience has positive effects on tourists' visit intention (Huseynov et al., 2020; Lin et al., 2023; Martins et al., 2021). For virtual environments, the online sensory experience of destination has a positive impact on users' offline visit intention (Li et al., 2023). A retail study investigating a virtual tour through the lens of brand experience showed that sensory experiences directly increased intentions to visit the store (Baek et al., 2020). A positive sensory experience brings pleasure to consumers, so consumers are willing to repeat this experience.

H5. Sensory brand experience positively affects brand loyalty.

2.2.6. *The mediating role of brand attitude*

Brand experience may impact brand loyalty not only directly but also indirectly. Studies have found that brand attitude plays a strong mediating role in the influence of brand experience on brand loyalty (Rajumesh, 2014; Shamim & Butt, 2013). Brand attitude is defined as a summary evaluation of a brand that presumably energizes behavior (Spears & Singh, 2004). People with a strong sense of positive brand experience also have a positive brand attitude, leading to an increase in purchase intent (Zarantonello & Schmitt, 2010). Sensory brand experiences enable consumers to make good reviews of brands, which leads to brand loyalty (Berry et al., 2002).

H6. Brand attitude positively mediates the relationship between sensory brand experience and brand loyalty.

2.2.7. *The mediating role of brand-self connection*

Brand relationships can be formed from a cascade of consumer experiences with a brand or can be developed by the accumulation of consumer experience. The multisensory experience of consumers is the key to building consumer brand preference and brand loyalty, and multisensory experience can produce better quality brand relationships than emotional experience (Gobe, 2010). Brand-self connection is a necessary construct that reflects the relationship between consumers and brands.

H7. Brand-self connection positively mediates the relationship between sensory brand experience and brand loyalty.

2.2.8. *The moderating role of gender*

Last, the model's relationships might be moderated by customers' characteristics (Khan et al., 2020). Marketers have long recognized that men and women have different preferences and reactions to brands, including differences in how they experience brand stimuli through the five senses. There are many differences between men's and women's senses and emotions, and women are generally considered to be more sensitive than men. Gender can also affect consumers' decision-making processes, with women being more likely to consider emotional factors and men being more likely to focus on objective factors. Some studies examined the moderating role of gender when studying brands, but the results were inconsistent (Islam et al., 2018; Molinillo et al., 2022). Therefore, this study attempts to examine whether gender is a valid moderator variable in this model.

H8. Gender moderates the relationships among sensory brand experience, brand attitude, brand-self connection, and brand loyalty.

The research framework, which includes the eight hypotheses, is shown in Fig. 1.

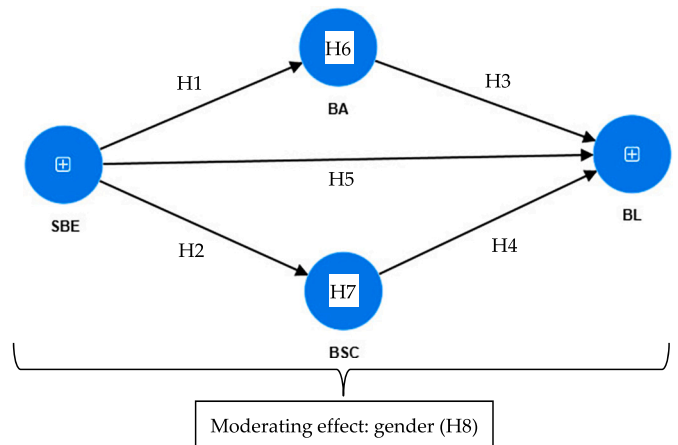


Fig. 1. Research framework.

3. Research methods and materials

3.1. Measurement scale

The data were collected using a questionnaire consisting of previously validated scales extracted from previous research (Table 1). All the items were the original sentences. For the constructs of brand-self connection and brand loyalty, some redundant items, or items with negative contribution to Cronbach's alpha in this study were deleted. All these scales were originally written in English and then translated into Mandarin. Back-translation was employed to maintain the fidelity of the original scales.

All responses were recorded using an ordinal 7-point Likert scale. For sensory brand experience and brand attitude, responses range from "completely disagree" to "completely agree." For brand-self connection, responses range from "very small" to "very large." For brand loyalty, responses range from "very impossible" to "very possible." Table 1 shows the details of this study's measurements.

Table 1
Measurement items and sources.

Construct	Item no.	Item	Reference
Sensory brand experience	SBE1	This brand makes a strong impression on my visual sense or other senses.	(Brakus et al., 2009)
	SBE2	I find this brand interesting in a sensory way.	
	SBE3	This brand appeals to my senses.	
Brand attitude	BA1	I like the brand.	(Cho, 2004)
	BA2	The brand is satisfactory.	
	BA3	The brand is desirable.	
Brand-self connection	BSC1	To what extent is (brand name) part of you and who you are?	(Park et al., 2010)
	BSC2	To what extent do you feel personally connected to (brand name)?	
	BSC3	To what extent do you feel emotionally bonded to (brand name)?	
Brand loyalty	BL1	I consider myself to be loyal to X brand.	(Villarejo-Ramos & Sanchez-Franco, 2005)
	BL2	I will buy X again.	
	BL3	X would be my first choice.	
	BL4	I will suggest X to other consumers.	

3.2. Participants and data collection

Data were collected through a web-based questionnaire survey. We performed the survey on a famous online survey platform in China called Sojump. It is a professional questionnaire survey platform with real samples and random respondents. The sample was composed of 304 individuals. Among them, 172 were female, accounting for 56.6 %; 132 were male, accounting for 43.4 %. In the choice of brand, the method of Brakus et al. was referred to (Brakus et al., 2009). To create variation in brand experience scores, they manipulated “experience strength,” asking about one-third of the respondents each to think about a brand that provides a “strong sensory experience,” a “moderate sensory experience,” or a “weak, or almost no, sensory experience” for them. Their manipulation was successful, as well as ours. The average brand experience score of the first group was higher than the latter two groups, and the score of the second group was higher than the third group.

3.3. Data analysis

This study tested the proposed model using partial least squares path modeling (PLS-SEM) through SmartPLS 4 software (Ringle et al., 2024). PLS-SEM is a variance-based structural modeling technique. It is a multivariate path modeling method typically used to predict the relationships among multiple independent and dependent latent variables (Hair Jr et al., 2021). It has also been suggested that PLS-SEM performs better than covariance-based regression analysis for the evaluation of mediation (Hair et al., 2019). In this study, the relationships among latent variables have been predicted, and a new model has been developed. This study aims to explore theory rather than to confirm an existing theory. Moreover, the evaluation of mediation is an important part of this study; thus, the PLS method is appropriate.

Data analysis was conducted as follows. First, the reliability and validity of the measurement model were analyzed. Second, the hypothesized model was tested. To guarantee the stability of the calculation results, a bootstrapping procedure with 5000 subsamples was used for the final estimation, as the SmartPLS software suggested. To test the mediating effects, the *p*-values and bias corrected confidence intervals were examined through PLS bootstrapping. Multi-group analysis (MGA) using PLS-MGA was performed to analyze the moderating effect. The *p*-values of path coefficient differences between groups decide the significance of the differences.

4. Results

4.1. Measurement assessment

The reliability of the model was assessed through factor loading, Cronbach’s alpha (CA), and composite reliability (CR) (Table 2). The factor loadings were derived through the PLS Algorithm. All the factor

Table 2
Reliability and convergent validity.

Construct	Item	Factor loading	Cronbach’s alpha	CR	AVE
Sensory brand experience	SBE1	0.976	0.968	0.979	0.940
	SBE2	0.963			
	SBE3	0.969			
Brand attitude	BA1	0.954	0.969	0.977	0.914
	BA2	0.958			
	BA3	0.959			
Brand-self connection	BSC1	0.954	0.945	0.965	0.901
	BSC2	0.947			
	BSC3	0.953			
Brand loyalty	BL1	0.948	0.819	0.892	0.733
	BL2	0.841			
	BL3	0.902			
	BL4	0.825			

loadings were higher than the threshold value of 0.7, and indicator reliability was confirmed. All the Cronbach alpha coefficients and CR values were higher than the threshold value of 0.7, and internal consistency reliability was confirmed. Convergent validity was assessed through the average variance extracted (AVE). All the AVE values were higher than the threshold value of 0.5, and convergent validity was confirmed.

Discriminant validity was evaluated by comparing the square root of the AVE of each construct with the bivariate correlations among constructs. According to Fornell-Larcker’s criterion, the inter-construct correlations must be below the square root of the AVEs (Fornell & Larcker, 1981). All the square roots of AVE were higher than the bivariate correlations among the constructs, and discriminant validity was confirmed. Table 3 depicts the assessment of discriminant validity. Thus, the measurement model has reliability and validity.

4.2. Structural model

4.2.1. Main effects

Fig. 2 and Table 4 depict the assessment of the main effects of the model. R^2 is a common criterion for inner model evaluation. The threshold depends on the contents of specific research topics. In general, the R^2 value of about 0.19 shows a weak explanatory power; the R^2 value of about 0.33 shows a moderate explanatory power; the R^2 value of >0.67 shows practical values. Sensory brand experience has positive effects on brand attitude ($\beta = 0.835, p = 0.000$) and explains 69.8 % of brand attitude ($R^2 = 0.698$), showing good explanatory power and supporting H1. Sensory brand experience has positive effects on brand-self connection ($\beta = 0.787, p = 0.000$) and explains 62 % of brand attitude ($R^2 = 0.62$), showing good explanatory power, supporting H2. Sensory brand experience, brand attitude, and brand-self connection together explain 92.2 % of brand loyalty ($R^2 = 0.922$), showing excellent explanatory power. Specifically, sensory brand experience, brand attitude, and brand-self connection all have positive effects on brand loyalty ($\beta = 0.168, p = 0.000; \beta = 0.619, p = 0.000; \beta = 0.215, p = 0.000$), supporting H3, H4, and H5. These results show that sensory brand experience, brand attitude, and brand-self connection are important drivers of brand loyalty. Particularly, brand attitude demonstrates the strongest direct effects among the three antecedents of brand loyalty ($\beta = 0.619, p = 0.000$). Thus, hypothesis H1, H2, H3, H4 and H5 are supported.

4.2.2. Mediating effects of brand attitude and brand-self connection

After estimating the direct effects of the model, the mediating effects were analyzed using SmartPLS 4 (Table 5). The indirect relationship between sensory brand experience and brand loyalty through brand attitude is significant ($p = 0.000, 95\%$ bias corrected CI = [0.403; 0.604] ($\alpha = 0.05$)). Brand attitude positively mediates the relationship between sensory brand experience and brand loyalty, supporting H6. The mediation type of brand attitude is complementary mediation, which means that direct and indirect impacts exist, and their directions are consistent.

The indirect relationship between sensory brand experience and brand loyalty through brand-self connection is significant ($p = 0.003, 95\%$ bias corrected CI = [0.088; 0.301] ($\alpha = 0.05$)). Brand-self

Table 3
Discriminant validity.

	BA	BL	BSC	SBE
BA	0.969 ^a			
BL	0.949 ^b	0.956		
BSC	0.887	0.895	0.949	
SBE	0.835	0.853	0.787	0.856

^a Square root of AVE in the diagonal.

^b Pearson correlations among constructs.

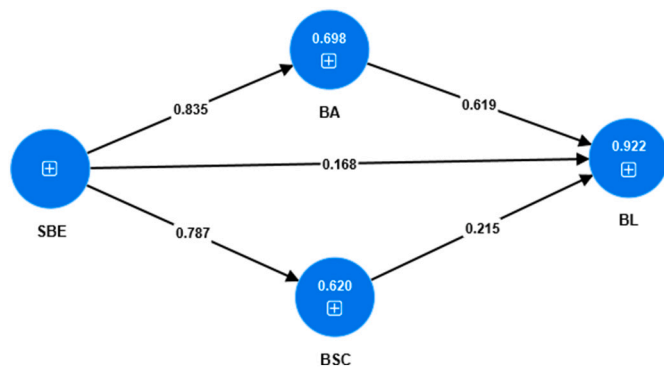


Fig. 2. Main effects.

Table 4
Path coefficients.

Hypothesis	Path coefficient	p-Value	Supported
H1. SBE→BA	0.835	0.000***	Yes
H2. SBE→BSC	0.787	0.000***	Yes
H3. BA→BL	0.619	0.000***	Yes
H4. BSC→BL	0.215	0.001***	Yes
H5. SBE→BL	0.168	0.000***	Yes

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 5
Mediating effects.

Path	Indirect effect	p-Value	95 % bias corrected CI
SBE→BA→BL	0.517	0.000***	[0.403; 0.604]
SBE→BSC→BL	0.169	0.003**	[0.088; 0.301]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

connection positively mediates the relationship between sensory brand experience and brand loyalty, supporting H7. The mediation type of brand-self connection is complementary mediation, which means that direct and indirect impacts exist, and their directions are consistent.

4.2.3. Moderating effects of gender

Measurement equivalence, or measurement invariance, is a necessary test for multi-group analysis. The measurement invariance of composite models (MICOM) procedure is used in PLS-SEM to assess measurement equivalence. In a three-step approach, MICOM requires analyzing the following elements: (1) configural invariance, (2) compositional invariance, and (3) the equality of composite mean values and variances (Hair Jr et al., 2017; Henseler et al., 2016). In this study, the items of each construct are the same, data processing is the same, and the calculus is set up the same way. So, the configural invariance is established. For compositional invariance, the permutation p -values of BA, BL, BSC, and SBE are 0.746, 0.766, 0.225, and 0.360, respectively; neither is significant. Then, the compositional invariance is also established. For the third step, partial measurement invariance is established. In conclusion, cross-group path coefficients can be compared in this study.

The moderating effects of gender were tested through multi-group analysis (MGA) using PLS-MGA. Gender was divided into female and male. The results show that the model relationships have significant differences considering gender (Table 6). The effect of brand-self connection on brand loyalty significantly differs between females and males ($p = 0.000$). The path coefficient of females is 0.406 and significant, while the path coefficient of males is non-significant. The direct effect of sensory brand experience on brand loyalty is also significantly different between females and males ($p = 0.001$). The path coefficient of

Table 6
Moderating effects.

Cause and effect	Path coefficient of female	Path coefficient of male	Difference (female - male)	p-Value (female vs male)
BA→BL	0.496***	0.627***	-0.131	0.146
BSC→BL	0.406***	0.076	0.329	0.000***
SBE→BA	0.823***	0.859***	-0.036	0.288
SBE→BL	0.089*	0.308***	-0.218	0.001***
SBE→BSC	0.803***	0.769***	0.035	0.559
SBE→BA→BL	0.408***	0.539***	-0.130	0.097
SBE→BSC→BL	0.326***	0.059	0.267	0.000***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Bold lines indicate that gender differences in these paths are significant.

males is greater than that of females. The indirect effect of sensory brand experience on brand loyalty through brand-self connection is also significantly different between females and males ($p = 0.000$). The path coefficient of females is 0.326 and significant, while the path coefficient of males is non-significant. Therefore, hypothesis H8 is supported.

5. Conclusion and discussion

5.1. Conclusion

First, the results show that sensory brand experience directly and indirectly impacts brand loyalty. Sensory brand experience, together with brand attitude and brand-self connection, has 92.2 % explanatory power to brand loyalty (see Fig. 2, $R^2 = 0.922$). This value is so good that it is impossible to ignore the critical role of sensory brand experience in building a strong brand.

Second, this study identifies two mediating variables for the effects of sensory brand experience on brand loyalty: brand attitude and brand-self connection. Both mediations are positive and significant, but the indirect effect of the path via brand attitude (0.517) is much higher than the indirect effect of the path via brand-self connection (0.169) (see Table 5).

Finally, this study reveals the moderating effect of gender on relationships in the model. The influencing mechanism of sensory brand experience on brand loyalty is different between the male and female groups. Both groups have a direct path from sensory brand experience to brand loyalty and an indirect path mediated by brand attitude. The key difference is that the male group does not have a mediation path through brand-self connection, while the female group has (see Table 6). Correspondingly, the direct effect of sensory brand experience on brand loyalty of the male group is higher than that of the female group.

5.2. Theoretical implications

This study expands the research on consumers' experience with brands. The results provide some clues to the academic debate on whether a strong emotional connection is necessary for brand success. As mentioned above, brand attitude is a general evaluation of a brand, while brand-self connection represents a strong emotional bond (i.e., "hot affect") with a brand (Brakus et al., 2009; Thomson et al., 2005). Some scholars believe that the purpose of brand relationship research is to make consumers form a high degree of attachment to the brand (Park et al., 2013). However, others believe that in some cases, successful brands may not necessarily have a close relationship with consumers, nor do consumers have a high degree of attachment and love to the brand (Fritz et al., 2014). Our study shows that brand attitude is more important than brand-self connection in general, which means that in some situations, a strong emotional bond is optional for brand loyalty. In contrast, in other situations, it has a significant effect on brand loyalty.

We further discover one such influencing factor: gender. Brand-self connection has different functions for men and women. For men,

brand-self connection fails to lead to brand loyalty. For women, brand-self connection leads to brand loyalty. This result confirms that men and women have different decision-making processes. For both genders, strong emotions may be aroused by sensory brand experiences, but women are more likely to consider emotional factors for their purchase decisions. For women, the strong emotional connection between a brand and the self positively affects brand loyalty. In other words, in the case of men, a strong emotional bond may be unnecessary for brand success, while in the case of women, a strong emotional bond may be necessary.

5.3. Managerial implications

This study sheds light on developing brand loyalty strategies. In today's competitive market, brands are constantly looking for ways to differentiate themselves and create meaningful connections with their customers. One way to achieve this is by creating a unique and memorable sensory brand experience. Given the importance of sensory brand experience in inducing customer behavior, sensory marketing strategies are suggested. Here are some sensory marketing strategies. Visual elements: The use of specific colors, logos, fonts, or images can create a strong impression in consumers' minds. Auditory elements: Music, sound effects, and even silence can all be used to enhance a brand's image. Gustatory elements: For some products and services, such as food, beverages, or food service, taste is an especially important sensory element. Haptic elements: Tactile elements such as texture, temperature, and weight of a product can all affect consumers' perception and experience. Brand vibe: Brand vibe refers to the experience that a brand creates in a physical environment. Starbucks, for example, creates a "third place" feel through its unique coffee aroma, comfortable seats, and friendly staff, where people can relax and socialize.

In addition, since gender has significant moderating effects, gender differences should be considered when developing sensory marketing strategies. Men usually pay more attention to the functionality and practicality of products and have higher requirements for quality and durability. Women are usually more emotionally focused on brands.

According to the results of this study, especially for women, creating sensory brand experiences that elicit strong emotional connections has positive effects on building brand loyalty. For example, the following sensory marketing tactics can be adopted. Visual marketing: Use warm tones, romantic scenes, or compelling stories to resonate emotionally with women. Auditory marketing: Use soft music or warm voice prompts to make women feel cared for and warmed by the brand. Olfactory marketing: The use of pleasant aromas in product packaging, store environments, or marketing campaigns creates a pleasant olfactory experience that allows women to connect emotionally with the brand. Haptic marketing: Provide a soft, comfortable, or delicate tactile experience so that women can feel the quality and care of the brand during their contact with the product. Gustatory marketing: Incorporating delicious and savory flavors into products or offering specialty foods or beverages that are relevant to the brand, allow women to create an emotional connection with the brand during tasting.

5.4. Limitations and future research

First, the research on sensory brand experience as an independent construct is still in its infancy, and this study on the influencing mechanism of sensory brand experience on brand loyalty is also exploratory. Future research could further explore other possible mediating variables. Regarding moderators, this study found the moderating role of gender but did not study other moderators. Future research could explore other possible moderating variables, including other demographic factors like age and psychological constructs such as brand personality and product type (Khan et al., 2023). Second, the questionnaire inquiry for this study was conducted in China, and future research can be implemented in other countries to explore further and validate the relationship between sensory brand experience and brand

loyalty since people in different cultural contexts may have different reactions to sensory stimuli. Third, there may be some bias in sampling, limitations of the questionnaire design, and limitations of the survey time.

CRedit authorship contribution statement

Fang Gao: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Software, Writing – original draft, Writing – review & editing. **Zhongyuan Shen:** Project administration, Resources, Supervision, Validation, Visualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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