

Investigating the Impact of Customer Engagement on Customer Innovation Behaviors in Online Brand Communities

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Received: April 30, 2022; Accepted: May 13, 2022; Published: May 16, 2022

Abstract

In today's increasingly prosperous Internet economy, online brand communities are playing an increasingly important role in marketing. This paper starts with customer participation and studies its relationship with customer innovation behavior. Existing research shows that customers' sense of identity with brand community will make them have more innovative behaviors. Therefore, this paper explores the mediating role of identity (brand identity and community identity) in the relationship between customer participation and customer innovation. The research results show that customer participation has a positive impact on customer innovation behavior, brand identity and community identity have a positive impact on customer innovation behavior, and brand identity and community identity play an intermediary role in customer participation and customer innovation behavior, that is, customer participation can generate more customer innovation behaviors by strengthening brand identity and community identity.

Keywords: customer engagement ability, explicit participation, implicit engagement, identity, customer innovation behavior

1. Introduction

1.1 Research Background

With the rapid development of the Internet, the Internet economy is increasingly prosperous. The Internet breaks the traditional regional boundaries, and connects people in various aspects. The Internet has an obvious impact on brand communities. When the development of the traditional offline communities is facing headwinds, the online brand communities enjoy vigorous development. Online communication has great advantages over offline interaction, which are particularly prominent during today's breakout of the COVID-19 epidemic. The marketing mode of online brand communities is playing an increasingly important role in brand development.

Brand communities has become an important domain of brand marketing. Especially for established brands, building a perfect brand community can create a "brand circle", enhances consumers stickiness, increases the sales of products or services, helps improve the products and services, and promotes the healthy development of brands. The building and improvement of online brand communities has become the current trend of brand development.

1.2 Status of Research on Brand Communities

While brand communities are developing rapidly, the current research on brand communities is not sufficient in China. The concept of the brand community was formed in 2001 and first proposed by American scholars Muniz and O'guinn(2001). It was introduced into China in 2004. In the past over ten years in China, the focus of brand community research has gradually shifted from the discussion of the concepts to the role of brand communities, and the research has been continuously deepened. However, a review of the current domestic literature reveals that the research on brand communities is insufficient in terms of depth, sustainability and breadth. There are few studies on brand innovation, and the research is still immature.

1.3 Research Content

This research covers customer participation, identification and customer innovation behavior. Consumers in the brand community have different characteristics and various behaviors. While we cannot directly determine whether the characteristics of customers and their participation are conducive to customer innovation, existing research shows that the customers' strong identification with the brand community is conducive to customer innovation. On this basis, this study takes customer participation as the independent variable, identification as the

mediating variable and customer innovation behavior as the dependent variable to study the impact of customer participation on customer innovation behavior, verify the correlation between brand community identification (brand identification and community identification) and customer innovation behavior, and explore the mediating role of identification.

1.4 Research Objectives and Significance

1.4.1 Objectives

The brand community is to a large extent an embodiment of the customer-centric marketing model. It depends on the identification of community members with the brand community, which is the key factor in the brand community. Identification with the brand community can be divided into brand identification and community identification. (Huang Minxue et al., 2017) Customer behavior plays a decisive role in the development of brand communities, and customer innovation is a key factor for the vigor and the sustainable and healthy development of brand communities. Starting from customer participation ability and customer participation behavior, this paper explores whether the level of customer participation affects customer innovation behavior, and the role that identification plays in customer participation and customer innovation.

1.4.2 Theoretical Significance

While studies have revealed the positive impact of customer participation on customer innovation behavior, there is no in-depth analysis of its internal logic, especially in terms of the impact of brand communities on brand loyalty. In recent years, brand communities have been studied from more perspectives, and scholars are seeking innovation in research on brand communities. However, in general, there are more studies on brand communities and brand loyalty than on the behavior of community members. From the perspective of community members' participation behavior, this paper takes identification as the mediating variable to explore the impact of customer participation on customer innovation behavior in brand communities. By studying the relationship between customer participation behavior and customer innovation in the brand community, this paper explores the brand community strategies in the new era, with a view to providing insights for the research in this field.

1.4.3 Practical Significance

With the further rapid development of the Internet economy, companies that build brand communities for consumer cohesion will achieve a great breakthrough in their branding. Combined with the characteristics of the Internet era and the increasingly prominent role of consumers as the center of marketing, the brand community as a marketing mode can effectively meet the needs of consumers. At the same time, it is also conducive to the long-term relationship between brands and consumers, so that companies can leverage the consumers' loyalty to a brand to enhance their brand value as a whole. Proper brand community operation can stimulate the vitality of companies and enhance their awareness of innovation. The current marketing modes and business models are becoming increasingly consumer centric, and the brand community marketing strategy based on consumer behavior is more likely to succeed. This paper carries out related research to provide reference for the development of brand communities for companies in the new era.

1.5 Innovation

At present, there is little literature on brand community from the perspective of consumer behavior, that is, the behavior of community members. Based on previous studies, this paper starts from the customer participation, which is divided into participation ability and participation behavior. This paper measures customer participation ability with their innovation ability, communication ability, recommendation ability, knowledge and learning ability: the stronger these individual characteristics, the stronger the customer participation ability. Participation behavior can be divided into explicit participation behavior (including expressing personal opinions, feedback, etc.) and implicit participation behavior (mainly clicking and browsing, without interaction with others). The former mainly includes information sharing, responsibility behavior and interpersonal interaction behavior; the latter mainly includes participation in use and experience, emotional participation behavior, etc. This paper studies identification as a mediating factor between customer participation and customer innovation behavior, which is innovative as there is little research on this aspect to date.

2 Literature Review and Theoretical Basis

2.1 Online Brand Communities

Muniz and O'Guinn (2001) propose that a brand community is a special consumer group, which is not limited by the region and connects consumers to brands with certain social relations. McAlexander et al. (2002) believe that a community is determined according to the commonness and identification among members, a brand community

is a relationship structure of customers, and marketers will promote community construction by creating an interactive environment. Bagozzi and Dholakia (2006) hold that a brand community is a social group formed by consumers with common enthusiasm for a brand, where consumers can achieve common goals or express mutual emotion and commitment through group behavior. In general, the above scholars emphasize the emotion and behavior of consumers towards the brand.

An online brand community is an online counterpart of an offline brand community. As the name suggests, the communication and activities of offline community members are conducted offline. In contrast, the communication of community members in the online brand community relies on the Internet. They mainly exchange experience and views on the brand through online platforms such as forums and social platforms.. Jeong et al. (2020) argue that compared with the traditional brand communities, online brand communities are more widespread, with lower thresholds, more members, and thus more far-reaching impact on brand development. Li ChaoHui et al. (2019) used empirical data to verify that companies can attract more customers to participate in new product development or marketing interactions through virtual brand communities.

2.2 An introduction to Customer Participation

2.2.1 Customer Participation Ability

Prahalad et al. (2000) divide customer competence into knowledge and skills, economic ability, the ability to participate in active dialogue and the desire to learn and practice. Brugmann and Prahalad (2007) believe that customer competence is the customers' knowledge, desire to learn and practice, and ability to actively participate in dialogue. He Guozheng and Chen Rongqiu (2009) hold that customer competence consists of innovation ability, knowledge, cooperation ability and communication ability. Feng Jinzhan and Cai Shuqin (2020) hold that customer competence is the brand product knowledge and customers' time and energy. Li Qiang et al. (2021) believe that customer participation ability is customers' individual characteristics such as knowledge and skills, which can bring value to the company in the value co-creation of the customers and the company. This paper adopts the views of Li Qiang et al., and holds that customer participation ability mainly includes customers' knowledge and learning ability, communication ability, recommendation ability and innovation ability in their participation in R & D, production, sales and other activities.

2.2.2 Customer Participation Behavior

Rodi & Kleine (2000) describe customer participation from the perspective of the concept of behavior, and believe that customer participation behavior is the resources provided or behavior carried out by customers in the production and delivery of products or services. Ennew & Binks (1999) believe that customer participation behavior consists of information sharing, responsible behavior and interpersonal interaction. Information sharing refers to the sharing of personal information between customers and product or service providers, which helps to ensure that customers' needs are met and is the most basic form of customer participation behavior; responsible behavior means that customers regard themselves as a part of the producers; interpersonal interaction refers to the communication between the customers and between the customers and product or service providers. Kozinets et al. (2008) specifically divided the activities in online communities into 2 parts. The first part is "learning and consuming", which includes improving their membership awareness, learning the content in the community, mastering the community rules and skills, and thinking over other members' feedback. Such activities are mainly implicit behavior that does not involve interaction with others. The second part is "doing and producing", which includes expressing personal views, asking questions, participating in projects and giving feedback. Such activities are explicit behavior of initiating or responding to the interaction and communication between members. Kozinets et al. believe that implicit behavior is closely related to explicit behavior, and that consumers' implicit activities have the function of improving their own expertise and skills, and can promote innovative behavior. Wu Wenzhen et al. (2017) propose the dimensions of customer participation from three aspects: information sharing, cooperative behavior and joint decision-making. Huang Xiaozhi et al. (2017) believe that customer participation behavior usually requires value co-creation by customers and companies. Li Jing et al. (2020) from the perspective of participation style, the basic element of participation behavior, divided customer participation into three basic types: task participation, social participation and contribution participation, and studied the impact of customer participation style on corporate brand equity. Gao Fang (2021) defined customer participation as the psychological or physical behavior of customers in the process of participating in the creation of goods or services. Integrating the above views, this paper divides customer participation behavior into explicit participation behavior and implicit participation behavior.

2.2.3 Social Identification

Zhang Yingrui and Zuo Bin (2006) hold that social identification means individuals' recognition that they belong to a specific community and their experience of feelings and meaning brought by the community. Previous studies have demonstrated that identification can play a positive role in many fields. For example, customers with high brand identification are more attached to the corresponding brand (Hu Bing et al., 2015). Yin Jianping et al. (2020) research shows that consumers' brand identity can significantly improve brand loyalty, and brand identity plays a mediating role between emotional marketing and brand loyalty. Different dimensions of identification have been proposed in the studies of many researchers. For example, Lin & Leung (2014) used organizational identification and work unit identification in their research, and Horstmeier et al. (2016) used professional identification and team identification.

In a brand community, members can show the consistency of their community identification by participating in community activities. The relationship between consumers and the community is "community identification" (Bergami, M., 2000). "Brand identification" emphasizes the close relationship between consumers and brands. Huang Minxue et al. (2017) hold that brand identification emphasizes consumers' feelings for the brand while community identification emphasizes individuals' sense of belonging to the community, and that community identification is not completely related to brand identification. However, there is still a certain relationship between the two. Wang Jia et al. (2021) defined the concept of "online brand community-brand fit" perceived by consumers, and explored its moderating role in the process of community identity acting on brand identity. Group identity has a positive impact on brand identity. Because this paper does not study the relationship between the two, so the two are studied independently. Therefore, this paper divides identification into brand identification and community identification.

2.2.4 Customer Innovation Behavior

Vargo and Lusch(2004) proposed the dominant logic of service that emphasizes the role of customer innovation behavior. Wang Xiaochuan et al. (2014) explored and summarized the customer innovation behavior in brand communities, which mainly includes participating in product survey, feeding back and revealing product defects, comparative analysis of competitive brands, evaluating and publicizing innovative products, discussing the future development of products and other activities. Zhao Jianbin et al. (2016) hold that customer innovation behavior refers to customers' novel and practical ideas about the brand.

3. Modeling and Hypotheses

3.1 Hypotheses

3.1.1 The impact of Customer Participation on Identification

According to Li Qiang et al. (2021), high customer participation ability can help continuously shape the identification of customers as "value co-creators" in the building of brand communities, so that customers can be incorporated in the company's value creation system. Will the customer participation ability affect customers' identification with the brand and community? The following hypotheses are proposed:

H1: Customer participation ability is positively correlated to brand identification

H2: Customer participation ability is positively correlated to community identification

Madupu and Cooley (2010) argue that interactive and non-interactive participants have different level of participation in online brand communities. Interactive participants can obtain information through their active participation and have good interactive experience, which can positively affect community identification. (Huang Minxue et al., 2015) The non-interactive participants spend more time and energy on browsing, query, knowledge acquisition and problem solving, so they can have a more comprehensive understanding of the community, which helps to produce a sense of identification. (Carlson B D et al., 2008) In addition, the interactive information of active customers has an impact and promoting effect on implicit participants, which helps to enhance their community identification. (Zhao Jianbin, 2018) The above interactive and non-interactive participation are basically consistent with the explicit participation behavior and implicit participation behavior studied in this paper. Combined with the division of identification into brand identification and community identification in this paper, the following hypotheses are raised:

H3: Explicit customer participation behavior is positively correlated to brand identification

H4: Explicit customer participation behavior is positively correlated to community identification

H5: Implicit customer participation behavior is positively correlated to brand identification

H6: Implicit customer participation behavior is positively correlated to community identification

3.1.2 The impact of identification on customer innovation behavior

Social identification theory reveals that the innovation behavior of users with high level of brand identification can bring them higher value form the participation, so they will have a stronger willingness to participate. (Kankanhalli A et al., 2015) Users with high level of brand identification pay more attention to the brand, have deeper feelings for the brand, and are willing to do something to help the brand(Piebler R et al., 2016), such as the customer innovation behavior.

When users have a stronger sense of identification with the community and its members, they have a better experience in the interaction in the community and will have more customer innovation behavior. Wang Yongyue et al. (2015) demonstrated the beneficial impact of employees' identity perception on employee innovation behavior in their research on company employees. Badrinarayanan et al. (2015) revealed the positive effect of players' identification and value co-creation behavior through their research on game communities. Based on the above analysis, the following hypotheses are put forward:

H7: Brand identification is positively correlated to customer innovation behavior

H8: Community identification is positively correlated to customer innovation behavior

3.1.3 The direct impact of customer participation on customer innovation behavior and the mediating role of identification

In this study, customer innovation behavior is the subsequence of identification, and customer participation is the antecedent of identification. The behavior of community members is driven by their perceived identification. On the one hand, customer participation may directly affect customer innovation behavior; on the other hand, customer participation can not only make community members feel the atmosphere of the community and sense of belonging, but also make them get more recognition in the process of community participation. Therefore, customers will have a deeper identification with the brand community, and then contribute to the better development of the community and have customer innovation behavior. Xin Benlu et al. (2021) concluded that customer participation can not only directly and positively affect employee service innovation behavior, but also indirectly and positively affect employee service innovation behavior through the mediating effect of information sharing. On this basis, the following hypotheses are put forward:

H9: Customer participation is positively correlated to customer innovation behavior

H10: Brand identification plays a mediating role between customer participation and customer innovation behavior

H11: Community identification plays a mediating role between customer participation and customer innovation behavior

3.2. Research Model

Based on the above theories and hypotheses, the following model is constructed

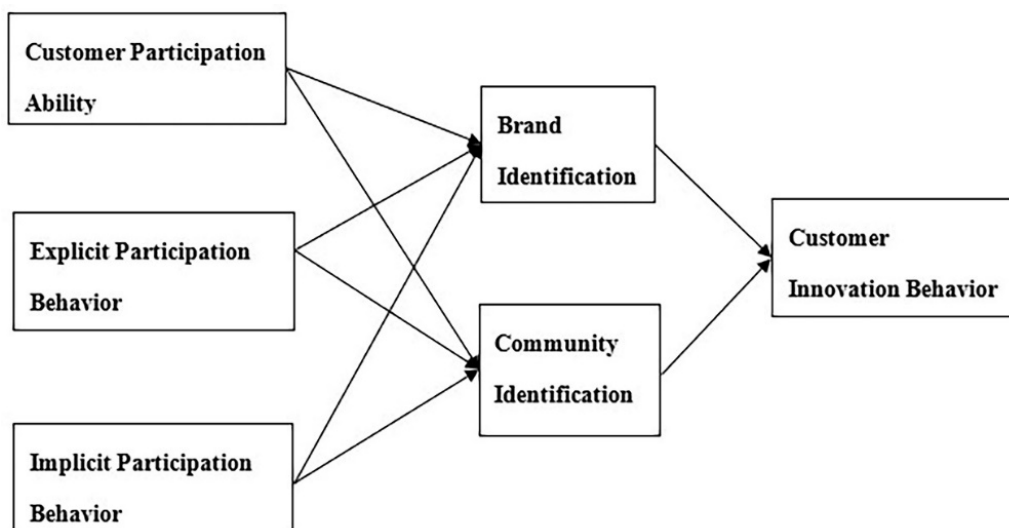


Figure 1. Structural equation model

In this paper, CA is defined as customer participation ability, CB as explicit participation behavior, CC as implicit participation behavior, BI as brand identification, CI as community identification, and I as customer participation ability.

3.3 Research methods

Based on the review of relevant literature in the early stage of this study, a questionnaire was designed and was distributed through social platforms to collect data. In the data analysis stage, the original data was first processed, the sample structure was analyzed, We apply SPSS 25.0 for descriptive statistical analysis and reliability test, and use Mplus8.3 to carry out validity test, and finally SPSS 25.0 was used for regression analysis and mediating effect analysis.

4. Questionnaire Design and Survey

4.1 Questionnaire design

The questionnaire used in this paper consists of 4 parts: basic information, survey of customer participation ability, survey of brand community identification, and survey of customer innovation behavior. The scales used in this paper were derived from the existing mature scales and modified appropriately. All items are measured by the 7 Point Likert Scale.

4.1.1 Measurement of Customer Participation

For the measurement of customer participation ability, 4 questions were extracted based on the literature review. According to the 4 dimensions of customer competence, the customer innovation ability, communication ability, recommendation ability, knowledge and learning ability were measured respectively. Based on the literature, 8 items were designed for the explicit participation behavior and 5 items for the implicit participation behavior.

4.1.2 Measurement of Identification

Brand identification and community identification was measured by referring to previous measurement methods of identification, mainly the scale of Badrinarayanan et al., with the respondents and items in the scale adapted to this study.

4.1.3 Measurement of Customer Innovation Behavior

For the measurement of customer innovation behavior, we mainly referred to the scale of Zhao Jianbin et al., and made appropriate adaptation on this basis to form items such as "I often put forward various new ideas in the community".

4.2 Questionnaire Survey

The respondents of the survey consisted of individuals with the experience of participating in online brand communities, which was explained in the questionnaire, so as to ensure that the samples collected have the experience of participating in the brand communities to suit the objectives of this study. Then the questionnaire was designed via wjx.cn, which was distributed through social platforms such as WeChat and QQ, and the data was collected via wjx.cn.

5. Data Analysis

5.1 Summary of Questionnaire Survey Results

A total of 126 questionnaires were collected in this study, of which 122 were valid. A questionnaire was considered invalid if 60% of the responses to the questions in a row were the same. The statistical distribution of valid samples is shown in Table 1. As to the gender distribution, the proportion of male respondents is slightly higher than that of the female. However, considering the limited sample size, it can be said that there is no obvious gender difference in participation in brand communities. From the perspective of age, young people constitute the main part of participants in brand communities, which indicates that the marketing mode of online brand communities is more popular with young people, who are more willing to participate in them. On the other hand, it may also be because online brand communities are closely related to the Internet while young people are better at using the Internet for consumption, communication and other activities.

Table 1. Sample structure

Variable	Type	Counts	Percentage (%)
Gender	Male	70	57.38
	Female	52	42.62
Age	17 and below	2	1.64
	18-29	108	88.52
	30-45	8	6.56
	46 and above	4	3.28
Education	High school and below	9	7.38
	Associate degree	6	4.92
	Bachelor	102	83.61
	Master and above	5	4.1

The method of measuring the variables in this paper is as follows:

Table 2. Measurement of Customer Participation

Dimension	No.	Option
Customer participation ability	4	I have a very strong innovation capability and can often raise innovative ideas
	5	I have a strong capability to spread information and can communicate the information I know to others rapidly
	6	I have a strong capability of recommendation, and others can easily accept my recommendations
	7	I have a strong learning capability and can rapidly master the methods for using products or services
Information sharing	8	I inform brands of my demands during my participation in communities
	9	I inform brands of my feedback on using products or services
	10	I point out the defects of the brand's products or services
	11	I share merits of products or services with others
Sense of responsibility	12	I think building an excellent brand requires the engagement of community members
	13	I try my best to communicate with brands to improve products or services
	14	I am willing to spend my resources such as time and money to facilitate the brand development
	15	I actively promote the brand's new products or services
Interpersonal interaction	16	I communicate with the brands in the community actively
	17	I interact with community members actively
Use and experience	18	I often search for and read the information on the brand
	19	I actively use the brand's new products or services
Emotional engagement	20	I have a great affection for the brand

Table 3. Measurement of Identification

Dimension	No.	Option
Brand identification	21	The brand image is consistent with my personalities
	22	I prefer the brand's products, compared with other brands
	23	I think the praise from others for this brand is also given to me
	24	I think the criticism from others for this brand is also given to me
	25	The brand's success is my success
Community identification	26	I have a sense of belonging to this brand community and believe that I am one of its members
	27	I think the praise from others for users in this brand community is also given to me
	28	I think the criticism from others for users in this brand community is also given to me
	29	The success of users in this brand community is also my success

Table 4. Measurement of Customer Innovation Behavior

No.	Option
30	I often participate in product surveys of the brand and give feedback on the use and experience
31	I often comment on the brand's products and compare them with competing brands
32	I often discuss the brand's future
33	I often provide various new ideas in the community
34	I often creatively solve problems related to products or services
35	I often raise some unique views
36	I often put forward original and practical solutions
37	I often offer many new ideas in the community
38	I often propose new creative ideas and views in the community

5.2 Descriptive Statistical Analysis

Table 5. Descriptive Statistics

	N	Minimum value	Maximum value	Mean value	Variance	Standard deviation
CA	122	1.25	7.00	4.53	1.06	1.03
CB	122	1.25	6.13	4.31	1.00	1.00
CC	122	1.20	6.40	4.55	0.82	0.91
BI	122	1.80	7.00	4.26	0.80	0.90
CI	122	1.00	6.50	3.88	1.35	1.16
I	122	1.00	6.44	3.81	1.05	1.03
Valid cases	122					

Table 6. Correlation Analysis

Correlation	Gender	Age	Education	CA	CB	CC	BI	CI	I
Gender									
Age	0.075								
Education	0.058	-0.330**							
CA	-0.048	0.024	-0.006						
CB	0.054	0.076	0.028	0.705**					
CC	0.074	-0.079	0.010	0.532**	0.748**				
BI	0.129	0.040	0.036	0.548**	0.530**	0.626**			
CI	0.171	-0.096	0.009	0.283**	0.425**	0.518**	0.736**		
I	0.034	0.025	-0.071	0.611**	0.640**	0.548**	0.565**	0.565**	

Note: ** indicates a significant correlation at the level of 0.01 (two-tailed).

It can be seen from the results of descriptive statistics that among the 3 dimensions of customer participation, the variance and standard deviation of implicit participation behavior are the smallest and the most stable, indicating that the difference in implicit participation behaviors is the smallest among the samples. Among all the indicators, the variance and standard deviation of community identification are the largest and the most unstable, indicating that the customers' community identification varies greatly among the samples.

From the results of correlation analysis, it can be seen that the customer participation ability, explicit participation behavior and implicit participation behavior are significantly correlated to community identification and brand identification, brand identification and community identification are significantly correlated to customer innovation behavior, and customer participation ability, explicit participation behavior and implicit participation behavior are significantly correlated to customer innovation behavior, which preliminarily supports the hypotheses of this study.

5.3 Reliability and Validity Analysis

5.3.1 Reliability Test

Table 7. Reliability Test

Variable	Number of items	Cronbach's α
Customer participation ability (CA)	4	0.811
Explicit customer participation behavior (CB)	8	0.890
Implicit customer participation behavior (CC)	5	0.774
Brand identification (BI)	5	0.772
Community identification (CI)	4	0.899
Customer innovation behavior (I)	9	0.919

SPSS 25.0 was used in this study for reliability test. As shown in the above table, for all the variables, the indicators of the internal consistency reliability (Cronbach's α) are larger than 0.7, indicating good measurement reliability of the variables.

5.3.2 Validity Test

Table 8. Validity Test

Model	χ^2/df	TLI	CFI	RMSEA	SRMR
Single factor: CA+CB+CC+BI+CI+I	3.768	0.490	0.520	0.151	0.121
Two factors: CA+CB+CC+BI+CI, I	3.424	0.553	0.580	0.141	0.118
Three factors: CA+CB+CC+BI, CI, I	3.072	0.618	0.643	0.130	0.114
Four factors: CA+CB+CC, BI, CI, I	2.883	0.653	0.677	0.124	0.112
Five factors: CA+CB, CC, BI, CI, I	2.839	0.661	0.687	0.123	0.109
Six factors: CA, CB, CC, BI, CI, I	2.773	0.673	0.701	0.121	0.104

In this study, Mplus 8.3 was used to test the validity, and the nested model was used to verify the validity between variables, as shown in Table 5. It can be seen that from the single factor model to the six factor model, the value of χ^2/df is decreasing (2.773 for the six factor model); the TLI value is increasing (0.673 for six factor model); the CFI value is increasing (0.701 for the six factor model); the RESEA value is decreasing (0.121 for the six factor model), and the 90% confidence interval was [0.113, 0.128], $P < 0.05$, indicating high significance; and the SRMR value is decreasing (0.104 for the six factor model). It can be seen from the above indicators that the six factor model has the best goodness of fit, indicating the highest discriminant validity and convergent validity between its variables.

5.4 Regression Analysis

Table 9. Regression Analysis

Model	Standardized coefficient β	R ²	Adjusted R ²	F	Significance
CA—BI	0.570	0.316	0.310	55.339	0.000
CA—CI	0.816	0.041	0.033	5.155	0.000
CB—BI	0.580	0.296	0.290	50.507	0.000
CB—CI	0.697	0.131	0.123	18.046	0.000
CC—BI	0.531	0.400	0.395	80.012	0.000
CC—CI	0.614	0.237	0.231	37.314	0.000
BI—I	0.578	0.300	0.294	51.474	0.000
CI—I	0.579	0.300	0.294	51.307	0.000
CA—I	0.553	0.351	0.346	65.039	0.000
CB—I	0.533	0.396	0.391	78.827	0.000
CC—I	0.583	0.291	0.285	49.228	0.000

Note: a significance of 0.000 indicates a significant correlation.

The path coefficients of the structural equation model obtained from the regression analysis are as follows:

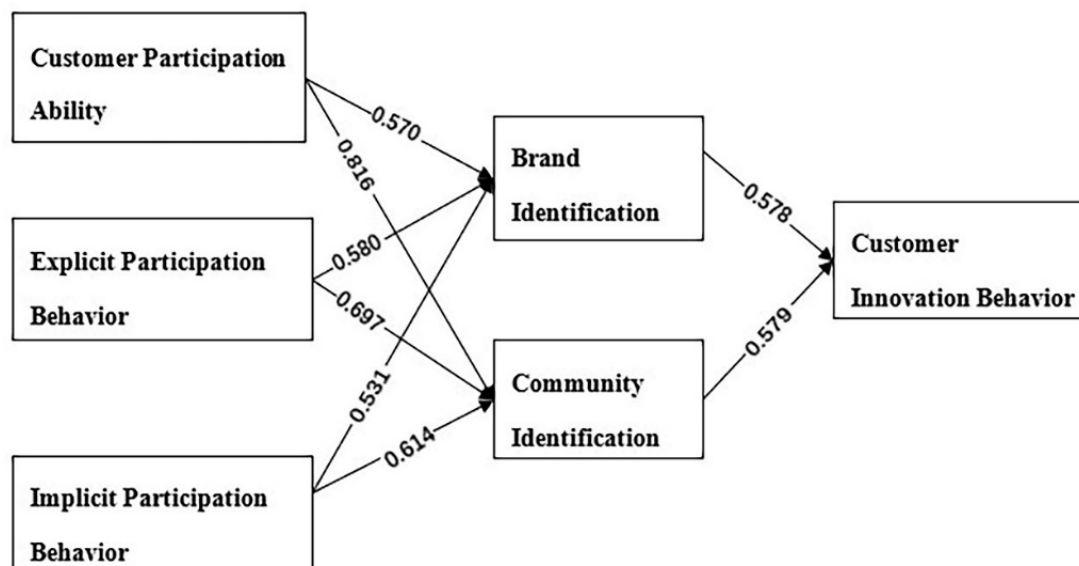


Figure 2. Path coefficients of the structural equation model

In this study, the linear regression analysis in SPSS was used to test the impact of the three dimensions of customer participation on brand identification and community identification, the impact of brand identification and community identification on customer innovation behavior, and the impact of the three aspects of customer participation on customer innovation behavior. It can be seen from Table 5 that for the relationship between customer participation and brand identification, the standardized coefficients β of customer participation ability, explicit participation behavior and implicit participation behavior on brand identification are all positive, and the significance is less than 0.05. Therefore, customer participation ability, explicit participation behavior and implicit participation behavior are positively correlated with brand identification. Among them, the standardized coefficient of explicit participation behavior on brand identification is the greatest ($\beta = 0.580$), indicating that explicit participation has the greatest impact on brand identification. Similarly, customer participation ability, explicit participation behavior and implicit participation behavior are positively correlated with community identification, among which customer participation ability has the greatest impact on community identification. Brand identification and community identification have a positive impact on customer innovation behavior; while community identification has a slightly greater impact on customer innovation behavior, there is no significant difference between them. Customer participation ability, explicit participation behavior and implicit participation behavior are positively correlated with customer innovation behavior, which shows that the three dimensions of customer participation can directly and positively affect customer innovation behavior, and implicit participation behavior has the greatest impact. Therefore, the hypotheses H1, H2, H3, H4, H5, H6, H7 and H8 were verified.

5.5 Test of Mediating Effects

For the verification of the mediation effect of brand identity and community identity, this paper refers to the suggestion of Preacher & Hayes (2008) on the multi-mediation model test, this paper determines the mediation effect by testing the significance of the indirect effect (the product term of the coefficient a from the independent variable to the mediator variable and the coefficient b from the mediator variable to the dependent variable). According to this, this paper uses Bootstrap's method to test the mediation effect, which can avoid the problem of violating the distribution assumption caused by the multiplication of coefficients, and improve the statistical power of the indirect effect test. In this paper, Bootstrap interval test is carried out according to the Process program of SPSS produced by Hayes. The path and results of the test are shown in Table 7:

Table 10. Test of Mediating Effects

Path	Value of indirect effect	95% confidence interval		P	Evaluation
		Lower limit	Upper limit		
CA—BI—I	0.1827	0.0880	0.3144	0.0005	Mediating effect verified
CA—CI—I	0.1273	0.0446	0.2437	0.0028	Mediating effect verified
CB—BI—I	0.1725	0.0869	0.2993	0.0005	Mediating effect verified
CB—CI—I	0.1615	0.0783	0.2791	0.0003	Mediating effect verified
CC—BI—I	0.2653	0.1003	0.4561	0.0003	Mediating effect verified
CC—CI—I	0.2284	0.1071	0.3954	0.0001	Mediating effect verified

Note: $P < 0.05$ indicates a significant correlation.

It can be seen from the results of mediating effect analysis that in the six paths of brand identification mediating customer participation ability and customer innovation behavior, community identification mediating customer participation ability and customer innovation behavior, brand identification mediating explicit participation behavior and customer innovation behavior, community identification mediating explicit participation behavior and customer innovation behavior, brand identification mediating implicit participation behavior and customer innovation behavior, and community identification mediating implicit participation behavior and customer innovation behavior, the values of the indirect effects are 0.1827, 0.1273, 0.1725, 0.1615, 0.2653 and 0.2284 respectively; the 95% confidence interval does not include 0, and the P values are all less than 0.05. Therefore, the mediating effects in the above six paths are established, and H10 and H11 are verified.

5.6 Results of Hypothesis Verification

As the three dimensions of customer participation are positively correlated to customer innovation behavior, customer participation is naturally positively correlated to customer innovation behavior, so H9 is true. Based on the above research, all the hypotheses proposed in this paper have been verified to be true. Therefore, it can be concluded that customer participation ability, explicit participation behavior and implicit participation behavior have a positive impact on brand identification and community identification respectively; brand identification and community identification have positive effects on customer innovation behavior, and play a mediating role between customer participation and customer innovation behavior.

Table 11. Results of Hypothesis Verification

Hypothesis	Verified or not	Hypothesis	Verified or not
Hypothesis H1	Verified	Hypothesis H7	Verified
Hypothesis H2	Verified	Hypothesis H8	Verified
Hypothesis H3	Verified	Hypothesis H9	Verified
Hypothesis H4	Verified	Hypothesis H10	Verified
Hypothesis H5	Verified	Hypothesis H11	Verified
Hypothesis H6	Verified		

6. Conclusions and Implications

6.1 Conclusions

The results of the above data analysis show that the hypotheses in this paper are tenable. Hence, we believe that customer participation has a positive effect on identification, and identification promotes the innovation behavior of consumers in the online brand community and acts as a mediating role between customer participation and customer innovation behavior. Specifically, customer participation ability, explicit participation behavior, and implicit participation behavior have a stronger impact on community identification than on brand community, possibly due to stronger and unique properties of the online brand community. The community can promote communication among its members, and enhance cohesion between members and a sense of belonging to the community, leading to a higher recognition of the community. However, in terms of the impact of brand identification and community identification on customer innovation behavior, there is no significant difference.

When brand identification and community identification act as a mediating role between customer participation and customer innovation behavior respectively, it can be seen that brand identification has a stronger mediating

effect, indicating that there will be more customer innovation behaviors when customer participation can bring higher brand identification. This means that when customers highly recognize a brand, they will have behaviors more conducive to brand development, which refers to customer innovation behavior in this paper.

6.2 Implications on Management

6.2.1 Customer participation

The three dimensions of customer participation have a positive effect on brand identification and community identification, and the effect on the latter is more significant. This means that customers with stronger customer participation ability and more explicit and implicit participation behaviors will focus more on community identification. Therefore, brands can constantly improve the brand community to make it attract more customers with stronger participation ability and contribute to more customer innovation behaviors. Enterprises may take active measures to identify customers with high innovation ability and implement some appropriate management and guidance policies. (Wang Wei et al., 2021) Enterprises should make efforts to enhance customers' higher recognition of the community so as to create more customer innovative behaviors and promote the innovation-driven development of brands.

6.2.2 Identification

According to the above analysis, brand identification has a stronger mediating effect between customer participation and customer innovation behavior, and the brand identification brought by customer participation is slightly weaker than the community identification brought by customer participation. This means that during the operation of brand community, brands need to encourage customers to pay more attention to brands. Brands may make greater efforts for the publicity of products and services in the community, expand the exposure of products and services, and enhance the understanding of products and services among community members, so as to boost community members' recognition of brands and further promote more customer innovation behaviors and brand innovation.

6.2.3 Other Relevant Strategies

Higher customer participation contributes to higher identification (brand identification and community identification), thus creating more customer innovation behaviors. Therefore, the following suggestions are raised for the development of brand community: (1) actively develop communities, accept the feedback of customers, and constantly improve brand products and services; (2) continue the user operation, stimulate customers' participation, and encourage more community members to participate in community development; (3) attach importance to the practical aspects of communities as well as the spiritual and emotional value of communities, and adhere to the creation of spiritual and emotional value; (4) actively interact with customers, and continue the creation and operation of contents to create a colorful community; (5) understand customers' needs by communication with customers, improve service quality, and win the trust and recognition from customers for brands.

7. Summary and Prospect

7.1 Summary

This paper focuses on brand community. In light of the rapid development of brand community in current marketing, this study is of certain value. Innovation is the key to stimulating brand vitality. Continuous innovation and improvement is the only way to realize sustainable and sound development of brands. From the perspective of theoretical research and practice, customer innovation behavior is an important way to facilitate brand innovation. Hence, the dependent variable studied in this paper -- customer innovation behavior, is helpful to brand innovation. This paper has generally achieved its research purpose by model building and quantitative analysis. However, progress and improvement in this study can be made in the future.

7.2 Limitations and Prospect

Limited to the environment where the author is located, the samples collected in this paper mainly include college students. So, there is no remarkable difference in sample characteristics, which may affect the accuracy of the study to some extent.

As for the measurement of customer participation in the model constructed in this paper, more studies need to be made to further verify its rationality and improve it. Besides, among the three dimensions of customer participation, customer participation ability may have a certain effect on participation behavior. But this paper does not discuss the relationship between them. Hence, further research in this aspect is needed.

Customer innovation behavior is the final object of this study. The methods for measuring innovation behavior are based on previous studies. In fact, this measurement is relatively general and vague. In the future, in-depth research on the measurement of customer innovation behavior will be conducted.

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