

# Research on The Influence Mechanism of Virtual Brand Community Participation on Users' Competitive Brand Attitude

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**Abstract.** This study explores the influence of virtual brand community participation on consumers' attitude towards competitive brands. This study took mobile phone industry community (Huawei, Xiaomi, Apple) as the research object. The analysis results show that the participation of virtual brand community makes members perceive benefits. In addition, hedonic, social and learning benefits are the main factors forming community commitment, especially hedonic benefits. When members have community commitments, they increase negative perceptions of other competing brands. In addition, UGC level negatively moderates the relationship between community participation and perceived benefits of virtual brands. Finally, this study provides some effective suggestions for enterprises to improve the community experience.

## 1. Introduction

A brand community is a community of consumers with a common interest in the same brand [1]. A brand community can influence the perception, behavior and even loyalty of its members [2]. For enterprises, brand community plays an important role in developing customer brand loyalty through relationship marketing [3]. Community members generally adopt positive attitudes and behaviors towards preferred brands, such as continuing to buy products with preferred brands rather than products of competitors. In addition, there will be negative views and resistance to competitors' products and brands [4,5,6]. This emotion is called competitive brand attitude (referred to as "CBA"). However, previous studies have paid little attention to competitive brand attitudes. Previous researches on brand community mainly studied the benefits of brand community from the perspective of business, the interaction between community members, the relationship between sharing consciousness and community commitment [5,6,7]. In the virtual brand community, the influence of the category and characteristics of community participation behavior on consumers' attitude towards competing brands is ignored.

Previous literature ignored the influence of different community participation behaviors on consumers' CBA in virtual brand communities. Therefore, the purpose of this paper is to study the influence of virtual brand community participation on CBA from the perspective of brand community participation. Our research question is the influence of virtual brand participation on consumers' perceived benefits and CBA.

1. There is no unified division of community participation behavior in previous studies. So our first research question was what type of community participation behavior is.

2. This paper adjusts and expands the model of Kuo et al [2]. In combination with our research background, embedding two types of customer engagement behaviors (information communication and social interaction) into a theoretical framework to understand how different customer engagement behaviors affect community commitment and competitive brand attitudes through perceived benefits.

3. The level of user-generated content (referred to as "UGC level") in a virtual brand community usually refers to the degree to which consumers contribute shopping and experience relevant

content. In the virtual brand community, Numerous studies have shown that UGC has an impact on user behavior. Our third research question is the moderating effect of UGC level on the relationship between community participation and perceived benefits.

In this paper, the rest is this arrangement, the second part mainly introduces the theoretical background, the third part is the research models and assumptions, the fourth part is introduced the research methods, the fifth part is the data collection and analysis, finally, we discussed the results, and sums up the theoretical and practical implications, and the limitations and future research.

## **2 Theoretical background**

### **2.1 The theoretical framework**

In this study, we apply social exchange theory [8].Based on the existing relationship marketing knowledge, this paper investigates the influence process of virtual brand community participation on the loyalty of opposing brands.

The research mainly refers to Ying-Feng Kuo and Lien-Hui Fen's work.Ying-Feng Kuo and Lien-Hui Fen developed and empirically validated a model to examine the mechanisms by which community participation affects consumer store loyalty[2]. According to their model, community engagement affects community commitment and online brand community loyalty through perceived consumer benefits. Consumers' perceived interests consist of learning benefits(Referred to as"LB"), social benefits(Referred to as "SB"), self-esteem benefits(Referred to as"SEB")and hedonic benefits(Referred to as "HB" ). Providing the benefits that members need is key to building a successful brand community, and these benefits are an important driver of member participation (Nambisan & Baron, 2009) LB reflects consumers' perceptions of cognitive or in the community participation learning benefits,SB reflect consumer perception of social comprehensive benefits (i.e., member of the relationship between each other more closely), SEB reflects the consumer perception of personal comprehensive (that is, the members can improve their status in the community), HB reflects the members in the community feel comfortable and enjoyable. These four dimensions also fit with the use and satisfaction framework[9]Ying-Feng Kuo et al.'s framework, That is, perceived benefits play an intermediary role in the influence of community participation on community commitment(Referred to as"CC") and consumer loyalty, which forms the basic framework of this study.

### **2.2 Virtual brand community participation**

Ridings et al. emphasized that users' participation in virtual brand community is to gain relevant information[10]. Another motivation is to establish and strengthen social connections,and to obtain information related to product purchase.That is to say, there are two main types:information exchange and social interaction [9.11.12]. Burnett thought information communication is the main activity,(1)Non-interactive behaviours, Limited participation in community activities and passive state, such as browsing community posts;(2) Collaborative and positive interactive behaviours refer to users seeking information in the community or sharing information with other users, taking the initiative to share product use experience with other members, helping other consumers solve confusion[13]. Social communication behaviors mainly refers to communicating with other community members, obtaining friendship, emotional and social support, gaining respect or care from members, and strengthening the relationship between members [11.14.15.16]. In the virtual brand community, information exchange and social interaction are the main behavioral activities [10.11.16]. Therefore, our research focuses on the two major behavioral activities. The definitions of the main concepts and structures of this study are shown in table 1.

Table 1. The definitions of principal concepts or constructs

Concept/construct	Definition	Reference
Learning benefits	Learning benefit means that members can obtain information and learn knowledge in the community.	KUO, YingFeng, FENG, et al,2013
Social benefits	Social benefit refers to the improvement of social relations that social members can get in the community.	KUO, YingFeng, FENG, et al,2013
Self-esteem benefits	Self-esteem benefits means that members can obtain better personal reputation and status in the society.	KUO, YingFeng, FENG, et al,2013
Hedonic benefits	Hedonic benefit means that members can obtain various kinds of happiness in the society.	KUO, YingFeng, FENG, et al,2013
Non-interactive behaviours	Limited participation in community activities and passive state, such as browsing community posts.	Burnett G. 2000
Collaborative and positive interactive behaviours	Users seeking or sharing information in the community,helping other consumers solve the confusion.	Burnett G. 2000
Social communication behaviors	Communicating with other community members, obtaining friendship and emotional and social support, gaining respect or care.	Wellman B,1999 McKenna KYA and Bargh JA,1999 Jin Feng jie, Zhao Jian bin, et al,2013
Community commitment	Community members want to maintain relationships with the brand community.	KUO, YingFeng, FENG, et al,2013
Competitive brand attitude	the members of the community may hold negative views and reject the competitors' brands.This emotion is called competitive brand attitude	Thompson & Sinha, 2008 KUO, YingFeng, FENG, et al,2013
UGC level	The degree to which consumers contribute content or co-create value that they and other users can derive from the community.	Schumann et al.2014

### 3 Research model and hypotheses

On this basis, the research model of this paper is proposed, as shown in figure 1

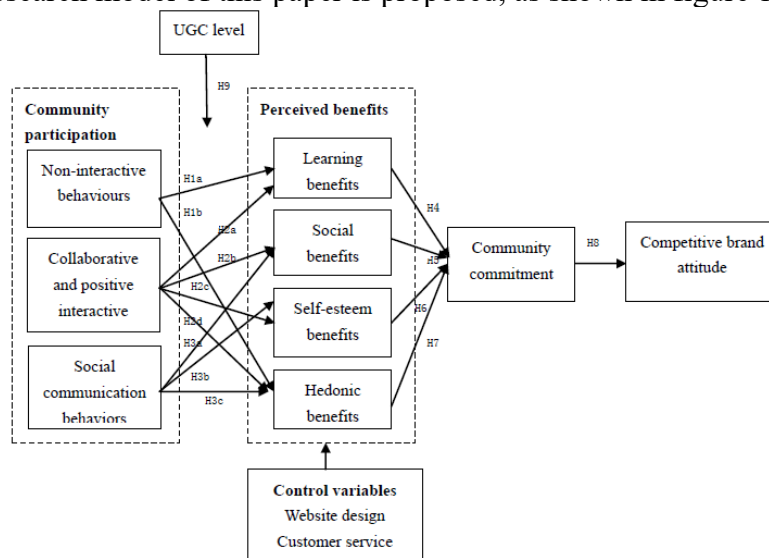


Fig 1 The research model.

#### 3.1 Virtual brand community user participation and perceived benefits

Non-interactive behaviours refer to the members to join the virtual brand community, just for information search and browse and get the information you need, do not recommend, comment on the content of the reading, not actively participate in the interaction between community members, active reply to posts, sharing the will of the product and brand information and less two-way

interaction [17]. Therefore, community members can search and browse information and obtain the information they need, so as to obtain relevant information about products and brands and gain learning benefits. In addition, and they can still enjoy the social interaction of other community members online (sharing interesting stories, funny gifs, etc.). Therefore, members of non-interactive behaviors will also experience pleasure and enjoyment. Therefore, we assume that

H1a: Non-interactive behaviors positively affect learning benefits.

H1b: Non-interactive behaviors positively affect hedonic benefits.

In the virtual brand community, members actively share product information, exchange attitude, and in the process of information interaction, they can get information they need, and the sense of belonging and respect, so as to promote the establishment of close relationship between customers [18.19]. they can enhance their status and reputation, gain social benefits [9.20.21]. In addition, members benefit from participating in activities and talking to each other [2].

H2a: Collaborative and positive interactive behaviours positively affect learning benefits.

H2b: Collaborative and positive interactive behaviours positively affect Social benefits.

H2c: Collaborative and positive interactive behaviours positively affect Self-esteem benefits.

H2d: Collaborative and positive interactive behaviours positively affect Hedonic benefits.

In online communities that promote social interaction among members, it is easier for members to get to know each other and make friends [5]. As a result, members can benefit socially from closer relationships. Moreover, the positive interaction among community members can make them feel goodwill, trust and respect [22]. members can share interesting experiences with other members and give them a sense of happiness. The feeling of joy spreads throughout the community [9]. Therefore, we assume that

H3a: Social communication behaviors positively affects Social benefits.

H3b: Social communication behaviors positively affects self-esteem benefits.

H3c: Social communication behaviors positively affects hedonic benefits.

### **3.2 Perceived benefit and community commitment**

Brand community commitment refers to the degree of psychological attachment between consumers and brand community and consumers' evaluation of the value of participating community [23]. positively perceived benefit-commitment relationships are supported in different contexts. Jin et al. found that perceived functional benefits (i.e. learning benefits) and social benefits lead to community commitment [24]. Gupta and Kim pointed out that functional benefits (i.e., learning benefits) and pleasure (i.e., hedonic benefits) positively affect community commitment [25]. In the online brand community, when the consumers' learning benefits, social benefits and hedonic benefits are satisfied, the community commitment will increase accordingly [2]. they will feel that the community is more reliable to maintain the long-term relationship [23.26]. Therefore, we assume that

H4: perceived learning benefits positively affect the community commitment.

H5: perceived social benefits positively affect community commitment.

H6: Perceived self-esteem benefits positively affect community commitment.

H7: Perceived hedonic benefits positively affect community commitment.

### **3.3 Community commitment and competitive brand attitude**

Thompson and Sinha found that members with higher community participation had higher brand loyalty [6]. Even if rival brands have new products that dominate the market [2]. Therefore, in the virtual brand community, competitive brand attitude will increase members' loyalty to the brand, and promote negative evaluation and opposition or resistance to the competitive brand, which is easy to weaken the competition of other brands. Therefore, competitive brand attitude can bring huge competitive advantages to enterprises. Therefore, we assume that:

H8: Community commitment positively affects competitive brand attitudes.

### **3.4 The moderating effect of UGC level**

At present, some virtual communities have a lot of user-generated content, but community participation and retention rate have declined to some extent. Moreover, some scholars have also found that more user-generated content in virtual communities will not directly lead to user participation and interaction. First, UGC quality is uneven. Jin et al.[27] believes that UGC quality problems mainly exist in three aspects: content error, junk content and low content value density. According to prospect theory, individuals are more sensitive to loss than gain, and the impact of loss is greater than that of gain. Second, cognitive load theory says that consumers have only limited working memory to process information. Therefore, UGC level will negatively regulate the relationship between community participation and perceived benefits. Therefore, we assume that:

H9a: When customers perceive a high level of UGC, the positive impact of non-interactive behaviors on learning benefits and Hedonic benefits will be weakened.

H9b: When customers perceive a high level of UGC, the positive effects of Collaborative and positive interactive behaviours on learning interests, social interests, self-esteem interests and hedonic interests will be weakened.

H9c: When customers perceive a high level of UGC, the positive impact of Social communication behaviors on social interests, self-esteem interests and hedonic interests will be weakened.

### **3.5 Control variables**

We have added a set of control variables that affect community participation and consumers' perceived interests to our research model Previous studies have consistently shown that web design affects consumers' perceived benefits [28.29.30.31] . Therefore, we take consumers' subjective evaluation of website design and customer service as a control variable to control its impact on consumers.

## **4. Research methodology**

### **4.1 Survey instrument**

The items used to measure constructs were adapted from existing literature to fit the context of this study. Appendix A lists all measurement items and sources. All items were measured on a likert scale of 5, ranging from 1(strongly disagree) to 5(strongly agree).We asked the researchers to review our questionnaire and, based on their feedback, made minor modifications to the measurement items to improve the effectiveness of the measurement items.

### **4.2 Data collection**

We conducted a cross-community data collection study. We selected huawei community, xiaomi community and apple community as our research objects, which are currently popular virtual brand communities. The data were collected through online surveys. There is a survey hyperlink on the community where each participant's ID is recorded to ensure that each respondent submits only one questionnaire. The survey was conducted over three weeks in the summer of 2019 and 213 questionnaires were received. We deleted some invalid questionnaires.Finally, 181 valid questionnaires were used for follow-up analysis.

Table 2 Demographics of the survey respondents(N=181).

Demographics	Category	Frequency	%
Gender	Male	71	39.2%
	Female	110	60.8%
Age	≤18	1	0.55%
	18-25	113	62.4%
	26-30	49	27%
	31-40	17	9.4%
	≥41	1	0.55%
Education	Junior high and below	2	1.1%
	High school	12	6.6%
	college	10	5.5%
	Undergraduate course	96	53%
Occupation	Postgraduate and above	61	33.7%
	students	90	49.7%
	work	78	43.1%
Time for each login	other	13	7.2%
	≥60min	37	20.4%
	30-60min	57	31.6%
	15-30min	37	20.4%
	≤15min	50	27.6%

## 5. Data analysis and results

### 5.1 Reliability and validity

Principal component factor analysis and confirmatory factor analysis (CFA) were performed simultaneously to assess the reliability and validity of the scale. Kaiser Meyer Olkin (KMO) statistic is .957, indicating that this data is applicable for factor analysis [32]. As shown in appendix B, all indicators were loaded as expected. Factor loading was greater than 0.6 and cross loading was less than 0.4, which had good convergence and discriminant validity [33].

CFA was used to further test the reliability and validity of constructs. As shown in table 3, klenbach alpha and combined reliability (CR) values between 0.891 and 0.960 per build, that is, higher than the recommended 0.7 [34], thus demonstrating satisfactory reliability. The convergence validity and discriminant validity of construct validity are tested. Mean variance extraction (AVE) and index load are tested to verify the validity of convergence. As shown in table 3, all AVE values are higher than the 0.5 recommended value [35]. The standard load of all projects was higher than the expected threshold of 0.7, with a significance of 0.001. This shows good convergence effectiveness [36].

Table 4 Reliability, convergence and discriminant validity analysis

	Standardized factor load	Composite reliability	Convergent validity	discriminant validity										
				Std.FL	CR	AVE	CBA	CC	HB	SEB	SB	LB	SCB	CPIB
CBA	.736-.931	.902	.755	<b>.869</b>										
CC	.873-.931	.960	.827	.669	<b>.910</b>									
HB	.887-.970	.948	.858	.643	.916	<b>.926</b>								
SEB	.807-.970	.776	.776	.655	.752	.775	<b>.881</b>							
SB	.914-.973	.876	.876	.609	.774	.774	.944	<b>.936</b>						
LB	.921-.967	.960	.888	.592	.818	.828	.669	.736	<b>.943</b>					
SCB	.863-.937	.935	.827	.598	.732	.717	.858	.825	.691	<b>.910</b>				
CPIB	.905-.979	.952	.868	.604	.655	.642	.840	.744	.560	.820	<b>.932</b>			
NIB	.908-.961	.933	.874	.184	.502	.507	.208	.262	.558	.343	.154	<b>.935</b>		

Note.

1. The bold diagonal is the square root of AVE, and the lower triangle is the Pearson correlation of dimensions

2. All standard loadings were significant at  $p < 0.001$ .

From the table of discriminant validity analysis, it can be seen that only the interests of self-esteem and society are slightly different, but still within the acceptable range, and the AVE



square root value of every other dimension is greater than its correlation with other dimensions. Therefore, the dimensions representing us have discriminant validity.

### 5.3 Hypothesis testing

The proposed hypothesis is tested by using structural equation modeling (SEM) based on covariance. This is because complex relationships are involved in the model.

As shown in table 2, we find that non-interactive behaviors have a significant positive impact on the benefits of learning and enjoyment, supporting H1a and H1b. Cooperative and positive interactive behaviors have significant positive effects on learning benefits, self-esteem benefits and hedonic benefits, as well as on social benefits. H2a, H2b, H2c and H2d are supported. Social interaction has a significant positive impact on social interests, self-esteem interests and hedonic interests, which supports H3a, H3b and H3c. Learning benefit, social benefit and hedonic benefit have significant positive effects on community commitment, supporting H4, H5 and H7. However, self-esteem benefit has no effect on community commitment, and does not support H6. Community commitment has a significant positive impact on competitive brand attitudes, supporting H8.

Table 5 Hypothesis testing

			Estimate	S.E.	C.R.	P
LB	<--	NIB	.447	.051	8.719	***
HB	<--	NIB	.323	.053	6.135	***
LB	<--	CPIB	.438	.049	8.935	***
SB	<--	CPIB	.177	.081	2.194	.028
SEB	<--	CPIB	.308	.067	4.600	***
HB	<--	CPIB	.270	.087	3.094	.002
SB	<--	SCB	.676	.085	7.968	***
SEB	<--	SCB	.520	.071	7.291	***
HB	<--	SCB	.342	.092	3.710	***
CC	<--	LB	.163	.039	4.144	***
CC	<--	SB	.108	.044	2.423	.015
CC	<--	SEB	.007	.051	.136	.892
CC	<--	HB	.549	.051	10.780	***
CBA	<--	CC	.814	.084	9.722	***

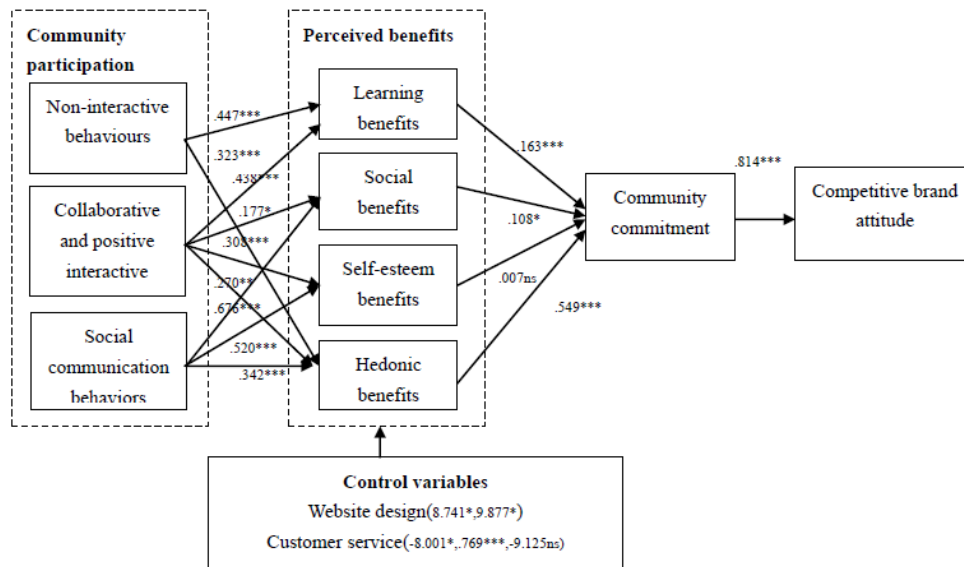


Fig. 2. The results of research model.

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001; ns: non-significant at the 0.05 level.

### 5.4 The test of mediating effect

#### 5.4.1 Mediating effect test of learning benefit and hedonic benefit in non-interactive behavior and

*community commitment*

The mediating effect of learning benefit and hedonic benefit is significantly different. The hedonic benefit (Point estimate= 0.715) is more significant than the learning benefit (Point estimate=0.285).DE=0.851, that is, the direct effect of non-interactive behaviors on community commitment is not significant. The benefits of learning and enjoyment have a complete mediating effect (Pc '=0.851).

Table 6 Mediating effect test

	Point estimate	Product of coefficients		Bootstrap 1000 time 95% CI					
				bias corrected			Percentile		
				SE	z-value	Lower	Upper	P	Lower
LB SIE	0.121	0.041	2.951	0.061	0.213	0.002	0.051	0.204	0.004
HB SIE	0.304	0.068	4.471	0.190	0.450	0.002	0.193	0.452	0.002
Total IE	0.425	0.085	5.000	0.281	0.596	0.002	0.277	0.593	0.002
DE	-0.006	0.045	-0.133	-0.076	0.063	0.800	-0.074	0.067	0.851
TE	0.419	0.088	4.761	0.262	0.583	0.003	0.265	0.588	0.002
LB/TIE	0.285	0.075	3.800	0.165	0.444	0.002	0.147	0.423	0.004
HB/TIE	0.715	0.075	9.533	0.556	0.835	0.004	0.577	0.853	0.002

*5.4.2 The mediating effect test of learning benefit, social benefit, self-esteem benefit and hedonic benefit in positive interactive behavior and community commitment*

Table 7 The mediating effect test

	Point estimate	Product of coefficients		bootstrap 1000 time 95% CI					
				bias corrected			percentile		
				SE	z-value	Lower	Upper	P	Lower
LB SIE	0.098	0.039	2.513	0.034	0.191	0.005	0.027	0.181	0.01
SB SIE	0.083	0.078	1.064	-0.07	0.237	0.228	-0.076	0.234	0.252
SEB SIE	-0.059	0.236	-0.250	-0.416	0.146	0.707	-0.64	0.11	0.406
HB SIE	0.356	0.076	4.684	0.234	0.519	0.004	0.246	0.556	0.002
Total IE	0.477	0.214	2.229	0.291	0.824	0.011	-0.041	0.686	0.055
DE	0.094	0.239	0.393	-0.072	0.546	0.239	-0.033	0.744	0.127
TE	0.571	0.087	6.563	0.446	0.778	0.003	0.454	0.794	0.002
LB/TIE	0.205	0.459	0.447	0.007	0.957	0.046	-0.038	0.716	0.06
SB/TIE	0.173	0.555	0.312	-0.295	0.658	0.276	-0.257	0.677	0.254
SEB/TIE	-0.123	2.648	-0.046	-1.123	5.767	0.699	-2.555	1.553	0.46
HB/TIE	0.745	1.87	0.398	-4.721	1.581	0.123	-0.354	2.487	0.055

The mediating effect of learning benefit and social benefit is significantly different from hedonic benefit. The mediating effect of hedonic benefit (Point estimate= 0.745) is more significant than that of learning benefit (Point estimate=0.205) and social benefit (Point estimate=0.173).Self - esteem benefits have no mediating effect.DE=0.127, that is, the direct effect of active and cooperative interactive behaviors on community commitment is not significant, so social interests and hedonistic interests play a fully mediating role (Pc '=0.127).

*5.4.3 The mediating effect test of social interest, self-esteem interest and hedonic interest in social communication and community commitment*

The mediating effect of social benefit and hedonic benefit is significantly different. The mediating effect of hedonic benefit (Point estimate= 0.944) is more significant than that of social benefit (Point estimate=0.266).Self - esteem benefits have no mediating effect.DE=0.175, that is, the direct effect of social interaction on community commitment is not significant, so social interests and hedonic interests play a full intermediary role (Pc '=0.175). Table 8.



Table 8 The mediating effect test

	Point estimate	Product of coefficients		Bootstrap 1000 time 95% CI					
				Bias corrected			percentile		
				SE	z-value	Lower	Upper	P	Lower
SB SIE	0.121	0.067	1.806	-0.005	0.259	0.057	-0.003	0.259	0.053
SEB SIE	-0.096	0.097	-0.990	-0.307	0.08	0.316	-0.3	0.082	0.34
HB SIE	0.43	0.065	6.615	0.319	0.579	0.002	0.317	0.574	0.002
Total IE	0.455	0.094	4.840	0.287	0.654	0.003	0.29	0.659	0.002
DE	0.123	0.085	1.447	-0.041	0.306	0.124	-0.059	0.288	0.175
TE	0.578	0.055	10.509	0.475	0.691	0.002	0.47	0.69	0.002
SB/TIE	0.266	0.167	1.593	0.004	0.671	0.047	-0.005	0.661	0.053
SEB/TIE	-0.211	0.274	-0.770	-0.926	0.138	0.321	-0.878	0.141	0.341
HB/TIE	0.944	0.196	4.816	0.733	1.483	0.001	0.714	1.393	0.002

5.5 Test of regulatory effects

5.5.1 Model 1

Table 9

	Estimate	S.E.	C.R.	P
ZLB <-- ZNIB	.248	.051	4.894	***
ZHB <-- ZUGC	.626	.056	11.120	***
ZHB <-- ZNIBUGC	-.145	.044	-3.342	***
ZLB <-- ZUGC	.603	.052	11.611	***
ZLB <-- ZNIBLUGC	-.179	.040	-4.461	***
ZHB <-- ZNIB	.177	.055	3.214	.001

The Product-Term is significant, so UGC level has a significant regulating effect on non-interactive behaviors, learning benefits and hedonic benefits.

5.5.2 Model 2

Table 10

	Estimate	S.E.	C.R.	P
ZLB <-- ZCPIB	.275	.053	5.188	***
ZHB <-- ZUGC	.507	.048	10.538	***
ZHB <-- ZCOIBUGC	-.191	.046	-4.185	***
ZHB <-- ZUGC	.616	.053	11.704	***
ZLB <-- ZCPIBUGC	-.145	.050	-2.891	.004
ZHB <-- ZCPIB	.451	.048	9.314	***
ZSB <-- ZCPIB	.563	.056	10.003	***
ZSEB <-- ZJHL	.719	.047	15.410	***
ZSB <-- ZUGC	.333	.056	5.961	***
ZSEB <-- ZUGC	.241	.046	5.193	***
ZSB <-- ZCPIBUGC	-.042	.053	-.783	.434
ZSEB <-- ZCPIBUGC	-.079	.044	-1.785	.074

The Product-Term is significant, so UGC level has a significant moderating effect on positive collaborative interactive behaviors, learning benefits and hedonic benefits, but no moderating effect on social benefits and self-esteem benefits.

5.5.3 Model 3

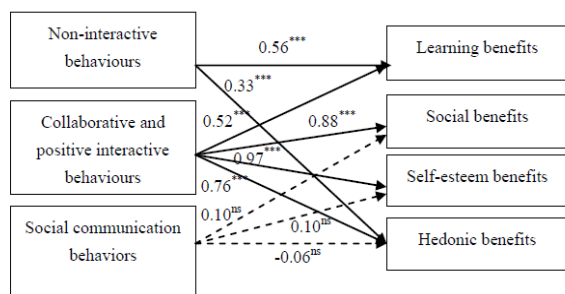
Table 11

			Estimate	S.E.	C.R.	P
ZHB	<--	ZUGC	.469	.053	8.829	***
ZHB	<--	ZSCBUGC	-.136	.043	-3.184	.001
ZHB	<--	ZSCB	.442	.052	8.482	***
ZSB	<--	ZSCB	.670	.054	12.446	***
ZSEB	<--	ZSCB	.712	.052	13.564	***
ZSB	<--	ZUGC	.220	.055	4.017	***
ZSEB	<--	ZUGC	.177	.054	3.308	***
ZSB	<--	ZSCBUGC	-.008	.044	-.187	.852
ZSEB	<--	ZSCBUGC	-.033	.043	-.764	.445

The Product-Term is significant, so UGC level has a significant moderating effect on social interaction and hedonic benefits, but no moderating effect on social benefits and self-esteem benefits.

To further test the intensity of the moderating effect, a subgroup analysis was performed. We divided the samples into two groups according to the average score (group with high UGC level above the average score and group with low UGC level below the average score) to determine the subgroups reflecting high UGC level and low UGC level. This also ensured inter-group and intra-group heterogeneity. Then we carried out a structural analysis and described in figure 3 the effects of non-interactive behaviors, cooperative and positive interactive behaviors and social interaction on learning benefits, social benefits, self-esteem benefits and hedonic benefits. The results are shown in figure 3 and figure 4.

(a) Low UGC level group(80)



(b) High UGC level group (N=101)

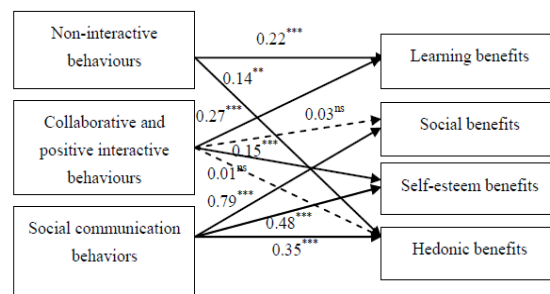


Fig. 3. The comparison of results by the UGC level groups. \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001; ns: non-significant at the 0.05 level.

6. Discussion and implications

6.1 Discussion of findings

This paper finds some interesting research. First, NIB are positively correlated with LB and HB, CPIB are positively correlated with LB and SB, SEB and HB, and SCB is positively correlated with SB, SEB and HB. The effect of SEB on CC was not significant. Secondly, LB, SB and HB are positively correlated with CC. CC is positively correlated with CBA. Secondly, the mediating effect of HB in community participation and CC is more significant, and finally, the moderating effect is partly significant. Moreover, customer service in the control variable has a significant impact on the SEB, but not on the LB and HB, and website design has no significant impact on the LB and HB.

6.2 Theoretical implications

This study has some theoretical contributions. Our research focuses on the social interaction behaviors of users from the virtual brand community and non-interactive behaviors and interactive behaviors based on information exchange, and illustrates their compound effects on consumers' perceived interests and overall level results, i.e. competitive brand attitudes. This is in response to researchers' call for systematic studies of community participation rather than isolated studies.

Secondly, our study determines the types of engagement behaviors of virtual brand communities from a comprehensive perspective and verifies their important role in influencing consumers' perceived interests, community commitment and competitive brand attitudes. Our results contribute to our understanding of community participation.

Thirdly, Previous studies mainly relied on qualitative methods or investigating the problem in a single community. This study makes up for this by conducting an empirical study of competitive brand attitudes across multiple communities.

Finally, this study further understood the influence of UGC level on community participation behavior and customer perceived interest relationship in the context of virtual brand community. However, few studies have focused on the potential negative effects of UGC. Our study is the first to address this gap by focusing on consumer perceptions of UGC.

### **6.3 Practical implications**

First, there are big implications for managers. Community participation can improve the community commitment of consumers by improving their perceived interests, and help to increase the long-term friendly relationship between consumers and the community. The self-generated competitive brand attitude of network community members can not only enhance consumers' preference for brands, but also weaken competitors' brands. Secondly, This study found that consumers pay special attention to hedonic benefits. As shown in table 6, table 7 and table 8, the EB/TIE Point estimate value of hedonic benefits is the largest. merchants can add some entertainment elements or interactive elements in the community, so that consumers can get the perceived benefits. Then, in community management, merchants need to strictly control the quality and quantity of content, filter out false information and other information of poor quality, and appropriately delete similar and repeated information to control the quantity. Merchants can adjust UGC level appropriately according to specific situation and consumer demand.

### **6.4 Limitations and future research**

First, our study measured our community engagement behavior only in terms of social interaction and non-interactive and interactive behaviors based on product information exchange. The three factors identified in this study may not be exhaustive. Secondly, our sample adopts the cross-sectional survey method, which may be difficult to capture the long-term behavior of all users in the community. Finally, although we conducted an empirical study across multiple communities, this study only studied one type of community and was not extended to other virtual brand communities in different cultures. Future studies may test our research model in the context of different virtual brand communities.

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