



“Impact of online community interaction on value co-creation: Evidence from China”

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IMPACT OF ONLINE COMMUNITY INTERACTION ON VALUE CO-CREATION: EVIDENCE FROM CHINA

Abstract

This paper explores the effect of online community interaction on value co-creation. The goal is to investigate internal factors influencing value co-creation through the SEM model and offer company managers effective management advice. This study investigates 485 customers in Xiaomi and Huawei online communities in China. An online questionnaire survey and convenient sampling are used, and a quantitative research method is adopted. The results of empirical analysis show that online community interaction, including human interaction ($\beta = 0.141$, $p < 0.05$) and human-computer interaction ($\beta = 0.126$, $p < 0.05$) positively affect value co-creation. Meanwhile, both human interaction ($\beta = 0.300$, $p < 0.001$) and human-computer interaction ($\beta = 0.371$, $p < 0.001$) significantly affect flow experience. Then flow experience ($\beta = 0.689$, $p < 0.001$) positively affects community identity and community identity ($\beta = 0.488$, $p < 0.001$) positively affects value co-creation. Yet, both human interaction ($\beta = 0.051$, $p = 0.301$) and human-computer interaction ($\beta = 0.010$, $p = 0.858$) do not significantly affect community identity. Flow experience ($\beta = 0.032$, $p = 0.676$) does not positively affect value co-creation. The results also show that neither flow experience alone nor community identity alone can play an intermediary role between online community interaction and value co-creation. Flow experience and community identity play a partial chain-intermediary effect between online community interaction and value co-creation.

Finally, online community interaction, on the one hand, directly affects value co-creation, on the other hand, it indirectly affects value co-creation via chain-mediating factors comprised of flow experience and community identity. This study provides a theoretical foundation for companies to use psychological factors to promote customers taking part in value co-creation to enhance enterprise competitiveness.

Keywords

online community interaction, flow experience,
community identity, value co-creation

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INTRODUCTION

With the market becoming increasingly competitive, enterprises' competitions are increasingly represented as competitions among brands. Enterprises can gain a competitive advantage only by making their own brands preferred and chosen by customers. With the changing market environment, brand value is no longer created solely by businesses but by businesses and customers working together (Prahalad & Ramaswamy, 2004). Through value co-creation, many brands have established strong market positions. With the advent of the twenty-first century, advanced information technology and increasingly powerful network functions have resulted in the rapid development of online brand communities, which are run by specific brands in virtual networks and serve as network communication platforms for brand enthusiasts (Sicilia & Palazon, 2008). They include forums, blogs, and personal homepage, among others (Kozinets, 2002). They are online social interaction platforms with brands as the theme of communication that enterprises, brand customers, or third parties typically in-

itiate (Brodie et al., 2013). Thus, such platforms are becoming increasingly important for enterprises and customers to implement value co-creation, and they take an increasingly significant part in today's commercial ecology (Andersen, 2005).

However, despite many businesses establishing online brand communities, the effect of value co-creation is not realized. Even if an enterprise has a large customer base, the proportion of customers who are interested in and can take part in value co-creation is small, and not every customer is willing to invest time and energy in this process (O'Hern & Rindfleisch, 2010). Many businesses currently have little understanding of why and how customers take part in value co-creation (Payne et al., 2008). Previous studies rarely investigate the mechanism of consumers taking part in value co-creation from psychological motivations (Fuller, 2010). Guiding consumers to take part in value co-creation indeed has become an urgent problem in academic and business circles by studying customers' psychological motivations (Porter et al., 2011). Therefore, this study regards the customers in the online brand community as a research object and explores whether online community interaction significantly affects customer participation in value co-creation. In order to deeply explore the internal mechanism, this paper considers flow experience and community identity as the mediating variables to investigate whether and how the two can affect customers taking part in value co-creation. This study offers a theoretical foundation and action guideline for companies to encourage customers to participate in value co-creation and enhance enterprise competitiveness.

1. LITERATURE REVIEW

Online community interaction is an interaction that occurs in online communities and is the mutual behavior of multiple related individuals or groups in online communities (Gronroos & Helle, 2010). Online community interaction includes human and human-computer interaction. Human interaction entails community members communicating with one another via the internet. Human-computer interaction entails community members using computers to browse community interfaces, publish and receive information (Hoffman & Novak, 1996).

Flow experience refers to the pleasure state that customers experience when interacting in an online brand community (Csikszentmihalyi, 1975). It is an inherently pleasurable experience. Self-awareness, self-behavior, and the environment form a whole atmosphere that leads to a high concentration of attention, a feeling of time passing fast, and a feeling of physical and mental pleasure. As a result, customers forget about other things in their lives and enjoy community interaction (Privette, 1983).

Community identity refers to a recognition of self-concept by community members. In this process of psychological cognition and experience,

community members seek out a group similar to themselves and accept a series of behavior norms formulated by this community group in order to integrate into this group, thereby creating an emotional connection with the group and forming a feeling of belonging and dependence on the group (Payne et al., 2009).

Value co-creation refers to customers creating value with the company. For example, customers participate in various activities sponsored by the company, such as new product design and new product promotion in the community, provide timely feedback and suggestions on the product to the company, and co-create brand value with the enterprise (Zwass, 2010).

Previous research showed that online community interaction influences customer attitudes and experience. Chang (2013) confirmed that social networking site interaction is closely related to flow experience. He used qualitative research on the relationship between interaction and customer experience. It was found that customers gain attention and information during the interaction and are willing to enjoy pleasant feelings, which means that the interaction may impact the experience. According to Bilgihan et al. (2014), user interactivity and vividness are two factors that influence users' flow experience in the e-commerce environ-

ment. Different interactions may impact customer experience. Therefore, customers can communicate and discuss brand-related topics and browse related brand information in interaction. They are pleased to put in the effort and energy in searching, browsing, communicating, and sharing brand-related content, which triggers customers' feelings of happiness and produces a flow experience (Wang & Ma, 2013). The study intends to examine the positive effect of online community interaction on the flow experience.

Online community interaction provides community members with information value as well as emotional value, and it is simple to form emotional connections and commitments among members, gradually forming community identity. According to Bagozzi and Dholakia (2006), online community members tend to feel the community's social integrity. As the level and depth of interaction increase, community members will feel more and more consistent with the community, thereby strengthening community identity. Sung et al. (2010) thought that the members have homogeneity with the community due to interaction. This homogenous community awareness will give members a sense of identity and positive emotions towards the community. Whether online or offline, the more the interaction, the higher the community identity, and the ultimate loyalty to the community can be realized. Therefore, online community interaction can strengthen customers' emotions towards the community and help customers gain self-identity and social identity, contributing to the formation of community identity. The study intends to look into the positive effect of online community interaction on community identity.

It was shown that customers in an online brand community come together because they share common interests, possess a strong feeling of brand identity, and are willing to provide mutual support through communication and interaction, so they are even more willing to take part in value co-creation (Nambisan & Baron, 2009). According to Li et al. (2019), customers in online brand communities typically have knowledge and consumption experience related to the brand, interaction ability, shareable information and experience, making them well-suited to value co-creation. Therefore, customers can share valuable information and

get good experiences in interaction, so they have a solid ability to participate in value co-creation (McCull-Kennedy et al., 2012). The study intends to look into the positive effect of online community interaction on value co-creation.

Huang et al. (2016) investigated the online brand community "Xiaomi Community" and concluded that flow experience positively affects community identity. Cui (2016) used the Xiaomi community as an example to conduct an online brand community survey on the customer experience of Xiaomi mobile phone users. It was discovered that consumer's experience significantly affects community identity. Shin (2006) discovered that flow experience positively affects community identity while studying user behavior in social business platforms. This study intends to look into the positive effect of flow experience on community identity.

Previous research has linked flow experiences to exploratory, creative, and learning behavior. According to Hoffman and Novak (1996), users' flow experience in the network circumstance provides a significant psychological benefit. The goal of consumption experience is value co-creation; consumption experience and perception take a critical effect in value co-creation. It was demonstrated that flow experience has a significant effect on customer satisfaction in e-commerce platforms, as well as a significant effect on the intention and behavior of users (Hsu et al., 2013). Customers' interactive experiences with hedonistic brands, according to Merrilees (2016), will lead to stronger value co-creation. The greater the number of users who have fun, the more likely they would participate in value co-creation activities. As a result, it is possible to conclude that the flow experience will cause customers to express positive emotions, resulting in increased individual satisfaction and subsequent active participation in value co-creation. This study intends to look into the positive effect of flow experience on value co-creation.

Scholars confirmed that individual online participation activities could be promoted by community identity. Members of the community value their status and identity as community members and like to assist community development more effectively (Zhou, 2011). Carlson et al. (2008) discov-

ered that members who strongly identify with their community are even more willing to take part in value co-creation. Customers with a strong community sense will feel adscription sense (Payne et al., 2009). Customers' sense of belonging is reinforced when they participate in community activities, and it also motivates them to take part in value co-creation. This study intends to look into the positive effect of community identity on value co-creation.

Flow experience and community identity are the predictors of value co-creation and are influenced by online community interaction, respectively. Therefore, it is necessary to investigate whether the two play intermediary roles between online community interaction and value co-creation. This study intends to look into the mediating effect of flow experience and community identity between online community interaction and value co-creation.

2. AIMS AND HYPOTHESES

The study tests the relationship between online community interaction and value co-creation based on the literature review. In addition, the study explores the impact of online community interaction on flow experience and community

identity, the impact of flow experience on value co-creation and community identity, and the impact of community identity on value co-creation. Finally, the intermediary roles of flow experience and community identity will be tested. The following hypotheses are proposed:

H1a: Human interaction positively affects flow experience.

H2a: Human-computer interaction positively affects flow experience.

H1b: Human interaction positively affects community identity.

H2b: Human-computer interaction positively affects community identity.

H1c: Human interaction positively affects value co-creation.

H2c: Human-computer interaction positively affects value co-creation.

H3a: Flow experience positively affects value co-creation.

H3b: Flow experience positively affects community identity.

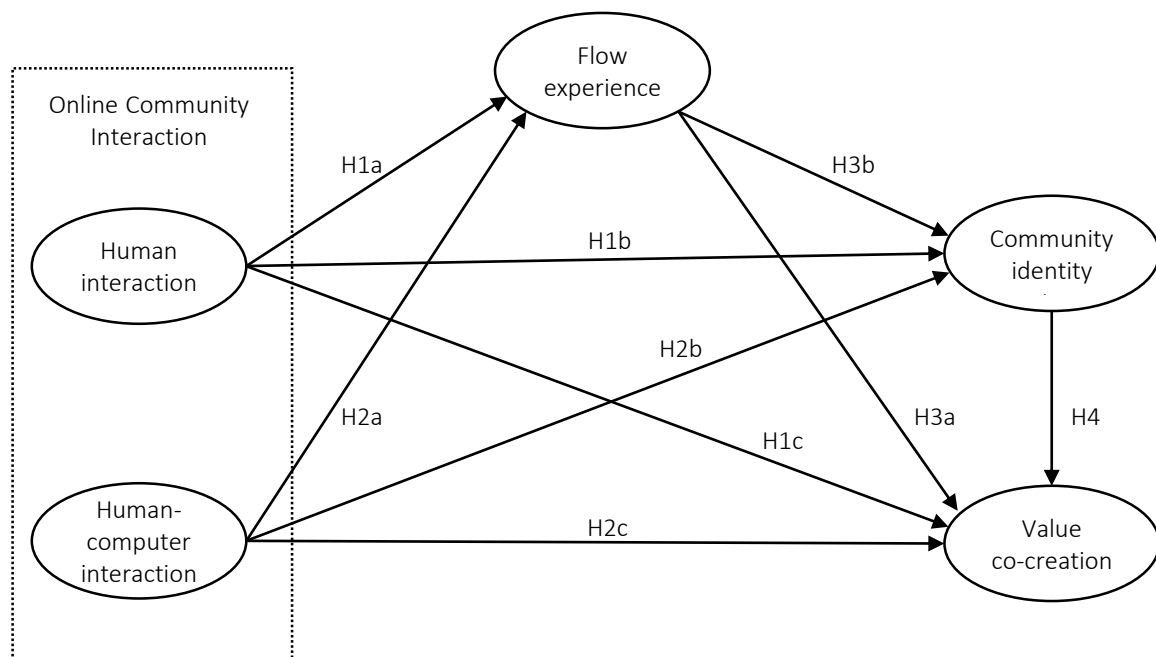


Figure 1. Theoretical model

- H4: *Community identity positively affects value co-creation.*
- H5: *Flow experience plays a mediating role between human interaction and value co-creation.*
- H6: *Flow experience plays a mediating role between human-computer interaction and value co-creation.*
- H7: *Community identity plays a mediating role between human interaction and value co-creation.*
- H8: *Community identity plays a mediating role between human-computer interaction and value co-creation.*
- H9: *Flow experience and community identity play a chain-mediating role between human interaction and value co-creation.*
- H10: *Flow experience and community identity play a chain-mediating role between human-computer interaction and value co-creation.*

According to the theoretical analysis, the theoretical model is shown in Figure 1.

3. RESEARCH METHODOLOGY

The study uses the questionnaire survey and quantitative analysis adopting SPSS22.0 and AMOS20.0. SPSS is used to conduct exploratory factor analysis, reliability, and validity analysis in the study. Furthermore, AMOS is used to conduct a path analysis and verify the hypotheses. At last, the study revealed the relation of the variables and proposed management advice.

The study uses 17 items to measure five variables (see Table 1). The scale exploited by Nambisan and Baron (2009) is used to measure human interaction, and it consists of three items. The scale exploited by Song and Zinkhan (2008) is used to measure human-computer interaction, and it consists of three items. The scale exploited by Chen et al. (1999) is used to measure flow

experience, and it consists of three items. The scale exploited by Chang and Chuang (2011) is used to measure community identity, and it consists of four items. Finally, the scale exploited by Zwass (2010) is used to measure value co-creation, and it consists of four items. All the 17 items are scored on a seven-point rating scale which is ranged from 1 to 7, meaning strongly disagree to strongly agree.

The objects of this study are customers in the online brand community. The study selects the largest and most representative online brand communities – Xiaomi Community and Huawei Pollen Club. Xiaomi and Huawei are the most potent domestic mobile phone brands in China, with many customers, a high reputation, and tremendous influence. More than 5 million are registered customers in Xiaomi Community, and more than 20 million are registered customers in Huawei Pollen Club. The success of Xiaomi and Huawei is closely related to their active implementation of value co-creation with customers in the online brand community, and they are examples of successful value co-creation. Therefore, choosing these two communities for analysis is representative.

The study conducted an online questionnaire survey in the two communities using convenient sampling. This study sent the link of the electronic questionnaire to the two communities, and customers in the communities clicked to open the questionnaire and complete it. Information was automatically transferred to backstage. 513 customers finished the questionnaires. 513 samples were collected, 28 invalid questionnaires were removed (that is, the answers to most questions were the same), and 485 valid questionnaires were finally received. This means that the effective rate of the questionnaire is as high as 94.5%. There were 163 females in the sample, accounting for 33.6%, and 322 males, accounting for 62.4%. 6 people under the age of 18 account for 1.2%; 440 people are between the ages of 18 and 40 (90.8%); and 39 people are over 40 years old (8.0%). Among them, 43 have a high school diploma or less, accounting for 8.9%; 407 have a bachelor's degree (83.9%); and 35 have a master's degree or higher (7.2%). This is consistent with the characteristics of the communities, implying that the data is representative and can be analyzed.

4. RESULTS

This study used SPSS22.0 to conduct reliability and validity analysis. First, the study conducted exploratory factor analysis. The results showed that the KMO value is 0.897 and $P < 0.001$, which indicates the sample data is suitable for exploratory factor analysis. Then, the study used principal component analysis to extract factors, and 5 common factors were extracted. Five factors' Cronbach's alpha and CR value are all higher than 0.7 (Nunnally, 1975), indicating the high reliability (Table 1). After that, the study used the factor loading of every item and the AVE value of every factor to test convergent validity. As shown in Table 1, the factor loadings are all significantly higher than the reference value of 0.6; the AVE values are all significantly higher than the reference value of 0.5, indicating the high convergent validity (Bagozzi et al., 1991).

The square root of every AVE value was compared to the correlation coefficients between factors to

assess discriminant validity (Fornell & Bookstein, 1982). As shown in Table 2, the square root of every AVE value (diagonal figures) is higher than correlation coefficients between factors (figures beneath the diagonal). The tests show a high level of discriminant validity.

The results of the model fit test show that the Chi-square value is 316.217, degree of freedom is 107. χ^2/df is 2.955, which is less than 3. RMSEA is 0.064, which is between 0.03-0.08. CFI = 0.956, AGFI = 0.896, GFI = 0.927, NNFI = 0.944, which are almost greater than 0.9. The indicators indicate that the model fit is satisfactory and can be used for path analysis (Table 3).

Based on the theoretical model (see Figure 1), the study set up the structural model using AMOS20.0 with human interaction and human-computer interaction as independent variables, flow experience and community identity as mediating variables, and value co-creation as a dependent variable (see Figure 2).

Table 1. Reliability analysis and convergent validity analysis

Variable	Item	Factor loading	CR	AVE	Cronbach's alpha
Human interaction	HI1	0.846	0.885	0.719	0.874
	HI2	0.871			
	HI3	0.826			
Human-computer interaction	HC1	0.810	0.848	0.651	0.803
	HC2	0.847			
	HC3	0.761			
Flow experience	FE1	0.735	0.815	0.596	0.846
	FE2	0.817			
	FE3	0.762			
Community identity	CI1	0.679	0.861	0.610	0.901
	CI2	0.796			
	CI3	0.822			
	CI4	0.818			
Value co-creation	VC1	0.797	0.857	0.602	0.844
	VC2	0.824			
	VC3	0.837			
	VC4	0.628			

Table 2. Factor correlation coefficients and discriminant validity

Variable	AVE	1	2	3	4	5
1. Human interaction	0.719	0.848	–	–	–	–
2. Human-computer Interaction	0.651	0.403**	0.807	–	–	–
3. Flow experience	0.596	0.414**	0.428**	0.772	–	–
4. Community identity	0.610	0.359**	0.335**	0.657**	0.781	–
5. Value co-creation	0.602	0.359**	0.328**	0.461**	0.549**	0.776

Note: ** $P < 0.01$.

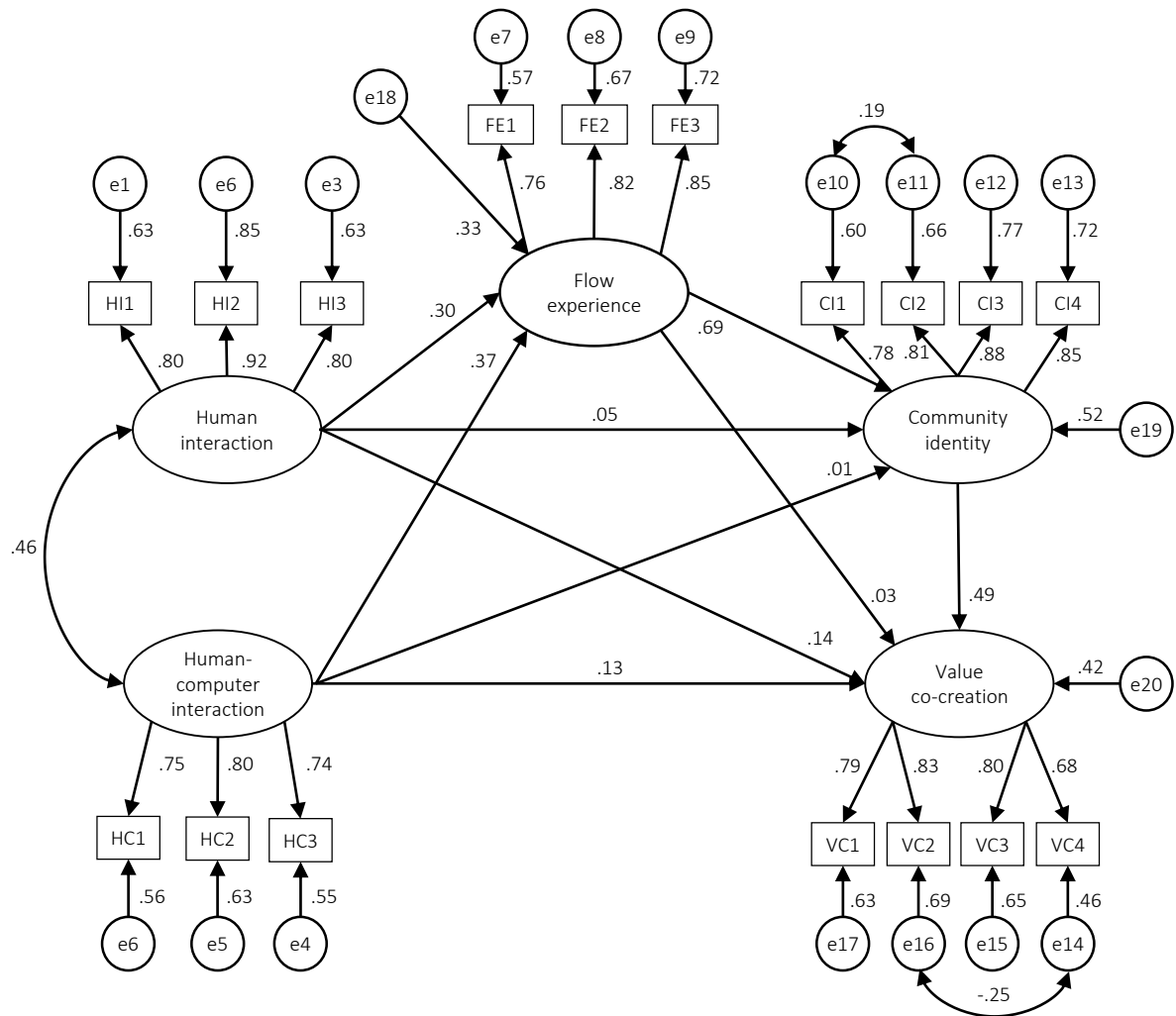


Figure 2. Structural model

Table 3. Model fit index

Index	χ^2/df	CFI	AGFI	GFI	NNFI	RMSEM
Statistical value	2.955	0.956	0.896	0.927	0.944	0.064
Threshold value	< 3	> 0.9	> 0.9	> 0.9	> 0.9	0.03-0.08
Meet standard	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

According to Table 4, the results of path analysis show that both human interaction and human-computer interaction are positively related to flow experience. Their path coefficients are 0.300 and 0.371, respectively; both significance test results are $p < 0.001$. Therefore, *H1a* and *H2a* are supported.

Both human interaction and human-computer interaction are not positively related to community identity. Their path coefficients are 0.051 and 0.010, respectively. The significance test results are $p = 0.301$ and $p = 0.858$, respectively, which are greater than 0.05, indicating that *H1b* and *H2b* are not supported.

Both human interaction and human-computer interaction significantly affect value co-creation. Their path coefficients are 0.141 and 0.126, respectively. The significance test results are $p = 0.007$ and $p = 0.027$, respectively, which are less than 0.05, indicating that *H1c* and *H2c* are supported.

Flow experience does not positively affect value co-creation. The path coefficient is 0.032, and the significance test result is $p = 0.676$, meaning that *H3a* is not verified.

Flow experience is positively related to community identity. The path coefficient is 0.689, and the

Table 4. Path analysis results

Path	Path coefficient	T	P	Hypothetical test
HI → FE	0.300	5.444	***	<i>H1a</i> is supported
HC → FE	0.371	6.201	***	<i>H2a</i> is supported
HI → CI	0.051	1.035	0.301	<i>H1b</i> is not supported
HC → CI	0.010	0.179	0.858	<i>H2b</i> is not supported
HI → VC	0.141	2.717	0.007	<i>H1c</i> is supported
HC → VC	0.126	2.211	0.027	<i>H2c</i> is supported
FE → VC	0.032	0.417	0.676	<i>H3a</i> is not supported
FE → CI	0.689	10.647	***	<i>H3b</i> is supported
CI → VC	0.488	6.590	***	<i>H4</i> is supported

Note: *** $P < 0.001$. HI = Human interaction, HC = Human-computer interaction, FE = Flow experience, CI = Community identity, VC = Value co-creation.

significance test result is $p < 0.001$, meaning that *H3b* is verified. Community identity significantly affects value co-creation. The path coefficient is 0.488, and the significance test result is $p < 0.001$, indicating that *H4* is verified.

In order to test the mediation effects, the study employs the Bootstrapping method, which involves repeating sampling 5,000 times and constructing a 95% confidence interval. Table 5 shows the test results. The total effect of human interaction on value co-creation is 0.210, and the significance test result is $p < 0.001$, indicating that the total effect is significant. The chain-mediating effect of flow experience and community identity is significant at the $p < 0.001$ level with the effect quantity of 0.077. However, the mediating effect of flow experience is not significant at the $p = 0.677$ (greater than 0.05) level with the effect quantity of 0.007. In comparison, the mediating effect of community identity is not significant at the $p = 0.450$ (greater than 0.05) level with the effect quantity of 0.019. Meanwhile, the direct effect of human interaction on value co-creation is significant at the $p = 0.017$ (less than 0.05) level with the effect quantity of 0.107. These show that flow experience does not mediate the relationship between human interaction and value co-creation, indicating *H5* is not supported.

Community identity does not play a mediating role between human interaction and value co-creation, indicating that *H7* is not supported. On the other hand, flow experience and com-

munity identity play a chain-mediating role between human interaction and value co-creation, and it is partially mediated, meaning *H9* is verified.

As shown in Table 5, the total effect of human-computer interaction on value co-creation is 0.257, and the significance test result is $p < 0.001$, indicating that the total effect is significant. The chain-mediating effect of flow experience and community identity is significant at the $p < 0.001$ level with the effect quantity of 0.120. On the other hand, the mediating effect of flow experience is not significant at the $p = 0.702$ (greater than 0.05) level with the effect quantity of 0.011, while the mediating effect of community identity is not significant at the $p = 0.881$ (greater than 0.05) level with the effect quantity of 0.005. Meanwhile, the direct effect of human-computer interaction on value co-creation is significant at the $p = 0.046$ (less than 0.05) level with the effect quantity of 0.121. These show that flow experience does not play a mediating role between human-computer interaction and value co-creation, indicating that *H6* is not supported.

Community identity does not play a mediating role between human-computer interaction and value co-creation, indicating that *H8* is not supported. On the other hand, flow experience and community identity play a chain-mediating role between human-computer interaction and value co-creation, and it is partially mediated, indicating that *H10* is supported.

Table 5. Test results of mediating effect

Path	Effect category	Path details	Effect	S.E.	T	95%CI		P
						Lower	Upper	
Human interaction → Value co-creation	Total effect	HI→VC	0.210	0.052	4.038	0.113	0.320	***
		HI→FE→CI→VC	0.077	0.023	3.348	0.041	0.133	***
	Mediating effect	HI→FE→VC	0.007	0.023	0.304	-0.035	0.058	0.677
		HI→CI→VC	0.019	0.026	0.731	-0.028	0.075	0.450
		Direct effect	HI→VC	0.107	0.047	2.277	0.022	0.203
Human-computer interaction → Value co-creation	Total effect	HC→VC	0.257	0.070	3.671	0.136	0.406	***
		HC→FE→CI→VC	0.120	0.040	3.000	0.062	0.220	***
	Mediating effect	HC→FE→VC	0.011	0.036	0.306	-0.064	0.083	0.702
		HC→CI→VC	0.005	0.042	0.119	-0.084	0.079	0.881
		Direct effect	HC→VC	0.121	0.068	1.779	0.002	0.267

Note: *** P < 0.001. HI = Human interaction, HC = Human-computer interaction, FE = Flow experience, CI= Community identity, VC = Value co-creation.

5. DISCUSSION

The results show that online community interaction is the antecedent of value co-creation. Online community interaction, including human interaction and human-computer interaction, significantly affects value co-creation (Nambisan & Baron, 2009). This is because customers in the online brand community generally have knowledge and consumption experience related to the brand and can interact, share information, exchange experiences. As a result, they can provide mutual support through communication and interaction and are highly willing to participate in value co-creation (Hsieh & Chang, 2016).

However, the research results find that human interaction and human-computer interaction significantly affect flow experience, flow experience significantly affects community identity, but human interaction and human-computer interaction do not significantly affect community identity (Chang, 2013). This shows that interaction does not directly lead to identity, and emotional factors play an indispensable and critical position between them (Bilgihan et al., 2014). In the open-structured networked interaction context, the release of emotional efficacy has become an effective way to connect interaction and group identity. Emotional needs become the internal

motivation for participation in interaction and a solid foundation for deepening identity.

In addition, this study also discovers that flow experience significantly affects community identity and community identity significantly affects value co-creation. However, flow experience does not significantly affect value co-creation. The results show that flow experience does not directly result in value co-creation (Carù & Cova, 2015). It needs to strengthen the customers' community identity to arouse customers' desire to participate in value co-creation.

Moreover, neither flow experience alone nor community identity alone can play an intermediary role between online community interaction and value co-creation. Online community interaction, including human interaction and human-computer interaction, indirectly impacts value co-creation via the chain intermediary factors consisting of flow experience and community identity. Flow experience and community identity play a partial chain-intermediary role between online community interaction and value co-creation. These results show that customers have flow experience during interactions, and community identity is generated based on flow experience, thereby facilitating customers to join in value co-creation (Merrilees, 2016; Laud & Karpen, 2017).

CONCLUSION

The study probes the relationship between online community interaction and value co-creation in online brand communities and also probes the intermediary role of flow experience and community identity. The purpose is to investigate the internal mechanism and influence route of online community

interaction on value co-creation and to furnish a theoretical basis and action guideline for company managers. The research results show that online community interaction, including human interaction and human-computer interaction, directly influences value co-creation. On the other hand, it indirectly influences value co-creation via chain-mediating factors comprised of flow experience and community identity. Flow experience and community identity play a partial chain-intermediary role between on-line community interaction and value co-creation.

The study results provide valuable suggestions to enterprises in terms of practical significance. First, enterprises should encourage their customers to interact in online brand communities. Companies should establish functional sections in communities in scientific and reasonable manners to encourage customers to participate in various interactions. Companies should also come up with exciting topics to encourage customers to converse and discuss. To encourage interactions, user-level promotion mechanisms should be put in place. Second, companies should offer their customers a flow experience. Companies should foster a positive community environment in order to increase customer pleasure. In addition, to meet their growing experiential needs, companies should provide different content and value to different customers based on their needs.

Furthermore, the companies' extensive functions and services contribute to customers' more convenient communication and flow experience. Third, companies should strengthen customer community identity based on flow experience. Companies can fully utilize big data and other technologies, and appropriate and timely rewards based on customer contributions in community interaction can be given. These can boost their self-esteem and promote community identity. Furthermore, companies should prioritize their customers' contributions and returns. Members who make significant contributions can be publicly praised, and their significant contributions can be publicized in the community. These activities increase their sense of accomplishment and fulfillment, as well as their sense of community identity.

LIMITATIONS AND FURTHER STUDIES

The study has some limitations. First, the research data is primarily derived from the online brand community of mobile phones. It does not include research on other industries or products, which may affect the generality and applicability of the conclusions. Future research could broaden the scope to include online brand communities from other industries, making the findings more broadly applicable. Second, since this study collects data through online brand community customer self-evaluation, and all variables fall into the category of customers' perceptions or attitudes, which have a higher subjective willingness, the research conclusions may not be entirely accurate. Third, customers will not be the only ones studied in the future. Future research could start with online brand community managers and customers simultaneously, collect matching data for research and comparison, and increase the scientific nature of the research and the credibility of the conclusions. Finally, the inner mechanism of customers taking part in value co-creation needs to be thoroughly researched. To encourage customers to participate in value co-creation, additional variables that affect value co-creation would be identified in future studies.

AUTHOR CONTRIBUTIONS

Conceptualization: Xuemei Luo, Zhongwu Li.

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Methodology: Xuemei Luo, Zhongwu Li.

Data curation: Xuemei Luo.

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