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The Influence of Opinion Leaders' Interaction Quality on Platform Brand Value Based on the Logic of Prosumption

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Abstract

Social e-commerce has become a widely studied paradigm in the Web 2.0 era. We explore the impact of opinion leaders' interaction quality (IQ) on platform brand value from the perspective of prosumption and examines the mediating effect of customer engagement and the moderating effect of prosumers capability (PC). Data were collected from 318 e-commerce users from social e-commerce platforms via questionnaire. Structural equation modeling was used to examine the model and bootstrap sampling technique via AMOS 23.0 and Process macro model 17 was applied to test the proposed hypotheses. Findings indicate that IQ brings a more positive impact on customer engagement, and customer engagement also affects the platform's brand value. Meanwhile, customer engagement plays a significant mediating effect while the PC has different moderating effects in different pathways. This paper, examines the principle of IQ on platform brand value based on the logic of prosumption. Results indicated that social e-commerce platform should keep a close watch on the effect of opinion leaders on the platform, improve customer engagement by improving the inner emotional experience of platform users, and thus enhance the platform brand value.

Keywords

Prosumption, Opinion Leaders, Customer Engagement, Platform Brand Value

1. Introduction

With the rapid development of e-commerce, social e-commerce has become a

widely studied paradigm (Akram et al., 2021). Social e-commerce was first proposed by Yahoo, and then officially introduced into the academic world by scholars in 2007 (Curty & Zhang, 2011). Huang and Benyoucef (Huang & Benyoucef, 2013) believe that social e-commerce is based on social media and Internet technology to create a community platform on which users can freely create and exchange information and obtain products and services, and conclude the differences between social e-commerce and e-commerce.

Social e-commerce platforms mainly have the following characteristics: 1) social interaction: network collaboration, information sharing and other user social interaction are the primary activities of the platform, followed by commodity consumption (Wang & Zhang, 2012); 2) Collaborative co-creation: content produced and shared by users on the platform (Liang & Turban, 2011); 3) Authenticity of information: Trust is a challenging problem in the network environment. Social e-commerce platforms encourage users to share and comment, and increase the authenticity and transparency of commodity information on the platform through users' sharing of commodity information and shopping experience. Users are no longer single consumers, but consumers who jointly create value through self-produced content (Seran & Izvercian, 2014). In social commerce platforms, user-generated content (UGC) is an important source of product information, which will help consumers make online purchase decisions (Jia et al., 2023). The influence of social e-commerce platforms mainly comes from a great many users participating in social networks. Word of mouth and interactive activities in social networks can be a key factor in influencing users' attitudes and behaviors (Liang & Turban, 2011). In this process, producers play a key role, and high-level producers become opinion leaders. Opinion leaders can make an important influence on the opinions, decisions and behaviors of platform users (Zhao et al., 2018), which refers to the individuals who have a huge amount of impact within their network and who can make an influence on the opinions of connected individuals (Parau et al., 2017).

In the Web 2.0 era, interaction has become the core of co-creation of social e-commerce platforms (Vargo & Lusch, 2004). Summerlin and Powell's research proved that interaction can increase consumers' purchase intention (Summerlin & Powell, 2022). The opinion leaders' interaction is a course of positive communication and reciprocal influence between opinion leaders and the rest users of the platform (Cheung et al., 2020). Interaction is the core of customer engagement (Hollebeek et al., 2014; Lawrence, 2013) while customer engagement is the core of platform brand value (Ramaswamy & Ozcan, 2016). The interaction between customers and opinion leaders about brands will effectively strengthen the relationship between customers and brands, thus affecting the brand value of the platform. Previous studies were mainly carried out on the formation mechanism of platform brand value (Merz et al., 2009; Ramaswamy & Ozcan, 2016). Zhao et al. (Zhao et al., 2018) studied the influence of opinion leaders in the formation of group opinions on e-commerce platforms from the perspective of dynamics theory. According to our best knowledge, few studies have explored the impact

of interaction quality of opinion leaders on platform brand value from prosumption perspective. This study tries to cram this gap.

This study offers important contributions to extant literature. Although previous scholars have carried out extensive research on social e-commerce platforms, they have not paid much attention to opinion leaders. In this study, we construct a relationship model between the interactive quality of opinion leaders and the brand value of the platform in the Web 2.0 era to analyze how the interactive quality of opinion leaders affects the brand value of the platform. In addition, we also consider the producer capacity. This study makes contributions to in these fields. Firstly, we understand the impact of the interactive quality of opinion leaders on the brand value of the platform from the perspective of prosumption. Secondly, we show the process that the interaction quality of opinion leaders affects the platform's brand value. Finally, we highlight the moderating effects of users' prosumer capacity. We believe that our study will help fill in the gaps in existing research.

The paper is organized as follows: Chapter 2 presents the theoretical background of the paper. We propose a research model in Chapter 3 based on the hypothesis. In Chapter 4, we discuss the research methodology of the paper. A discussion of the results is shown in Chapter 5. The final section (chapter 6) concludes with a conclusion of the paper, the theoretical and practical implications, and limitations and future research directions.

2. Theoretical Background

2.1. Social E-Commerce Platform

Social e-commerce is an epitome of e-commerce, which uses Internet technology to carry out e-commerce interactions in the social media environment, and assists user content creation and user social interaction (Liang & Turban, 2011; Sharma & Crossler, 2014). Social e-commerce platform is a burgeoning business model of the Internet. Users mutually engage with other users by liking, commenting, collecting, sharing and following, etc. (Yan et al., 2016). In the course of shopping online, internet users usually visit, browse, decide which to buy and pay on social e-commerce platforms (Hewei & Youngsook, 2022). Apparently, Social e-commerce is an attribute of society (Liew et al., 2017). It improves differentiation with the help of relationships between consumers and re-spread through consumers' impromptu content, thus expanding the coverage of information to a broader range of people (Raharjo et al., 2021).

According to Gefen's theory (Gefen, 2000), trust can positively influence consumers' purchase intentions on e-commerce platforms and familiarity is a necessary condition for building trust. According to Hughes (Hughes, 2012) social networks are crucial for social e-commerce, and they examined the motivations behind why users of social networks engage in it from the standpoint of their intended use for social business. Shirazi et al. (Shirazi et al., 2022) investigated the impact of information sharing among consumers on e-commerce platforms, and the results show that the action of sharing social business information improves

consumers' cognition of acquaintance, ease of use and usefulness of social commerce platforms. Zhao et al. (Zhao et al., 2020) discovered a positive correlation between information quality and belief in the study of the influence of E-word of mouth on trust in social e-commerce platforms. In social e-commerce platforms, the function of opinion leaders is majorly embodied in two points: influencing the decision results of consumers and spreading opinions verbally. Above mentioned studies suggested that, in social e-commerce platforms users and platforms are closely connected through social networks, and opinion leaders can influence consumers' decisions through the establishment of word of mouth.

2.2. Prosumption

Prosumption was first proposed by Toffler in his book, which was defined as an economic activity that includes consumption and production (Kotler, 1986). Prosumption is described by Xie et al. (Xie et al., 2008) as value-creation activities done by prosumers that create the goods they ultimately consume and shape experiences. Ritzer & Jurgenson (Ritzer & Jurgenson, 2010) explicitly pointing out the emergence of prosumption in the digital age. Subsequently, Ritzer (Ritzer, 2015) proposed the production-extinction continuum model. The interconnected processes of production and consumption are increasingly evident everywhere in the internet age (Ritzer, 2014). Scholars' research on prosumption is based on service-oriented logic (Ritzer, 2014; Xie et al., 2008) Prosumers were defined as co-creators who generated value alongside enterprises, a process known as value co-creation (Prahalad & Ramaswamy, 2004).

Shirazi et al. (Shirazi et al., 2022) believe that well-informed consumers are on the rise, and they conduct pre-purchase research on products and shopping platforms to enhance purchasing results and as a type of social interaction. Ritzer & Jurgenson (Ritzer & Jurgenson, 2010) believed that prosumers were not born in the information age, and they divided prosumers into traditional prosumers (such as prosumers in fast food restaurants who clean up their after-meal garbage) and new forms of prosumers in the information age (especially related to web2.0). According to Shah et al. (Shah et al., 2020), three study avenues exist prosumers and co-creation, prosumers and user-generated content, and prosumers and informational capital. Shah et al. (Shah et al., 2021) examined the prosumption role as a mediator between privacy-safety risk and value co-creation. Shen et al. (Shen et al., 2020) investigated the adoption model of user-generated content in a Web 2.0 Internet environment by studying the connotation of consumption behavior and the quality of user-generated material. Opinion leaders are both customers and disseminators of information, consuming and producing information and experience. It can be said that opinion leaders belong to prosumers. Meanwhile, opinion leaders have a strong influence and are profitable consumers. Some of them can further become consumers of self-created brands by accumulating more traffic and creating brands.

Interaction is at the heart of value co-creation (Vargo & Lusch, 2004), while prosumption is the activity of value co-creation. The nature of online commu-

nication in the Web 2.0 era has changed into a large scale of conversations between users, including personal or social themes (Lehmkuhl & Reinhard, 2013). Digital platform was put forward by Ramaswamy & Ozcan (Ramaswamy & Ozcan, 2016) based on interaction, arguing that it is the interaction that generates value, rather than the traditional exchange of goods between enterprises and customers. As for the study of interaction quality, Brady & Cronin (Brady & Cronin, 2001) put forward the concept of interaction quality, believing that the attitude, behavior and skills of the interacting object constitute the interaction quality. Based on the stimulus-organism-response (S-O-R) paradigm, Shen et al. (Shen et al., 2023) investigated how perceived prosumer content quality and perceived interaction quality improve users' co-creation experiences and, as a result, impact their co-creation intents in the future. Bruhn et al. (Bruhn et al., 2014) defined interaction quality as the comprehensive evaluation of platform users on the superiority of interaction. In this study, the process of constructive dialogue and reciprocal impact between opinion leaders and other platform users is what we refer to when opinion leaders interact with social e-commerce platforms (Cheung et al., 2020).

2.3. Platform Brand Value

Brand value refers to the value added by branded products compared with unbranded products (Farquhar, 1989). Brand management under Web 2.0 focuses more on the cognitive behavior of consumers and the management of brand image and meaning (Kotler, 1986; Park et al., 1986). According to Ramaswamy & Ozcan (Ramaswamy & Ozcan, 2016), value is co-created by participants, which calls for a shift in brand thinking to allow stakeholders to create value either individually or collectively. The participation platform was designed as a grouping of individuals, things, interfaces, and procedures with a goal. The free economic model, the paid model, and the hybrid model, which combines the first two models from the standpoint of consumption, were the three main business models of platform brands in the sharing economy (Shen et al., 2020). Shen et al. (Shen et al., 2019) indicated that platform brands should fully recognize the important role that prosumers play in the market. Platform brand value is developed through a process of value co-creation (Prahalad & Ramaswamy, 2004). Platform brand value considers a variety of network relationships, not just consumer-brand relationships (Merz et al., 2009). Accordingly, Platform brand value is described as the perceived use perception of the brand that is co-created and co-determined by all participants through multiple network relationships (Shen et al., 2020).

3. Research Model and Hypotheses

3.1. Research Hypotheses

3.1.1. Opinion Leaders' Interaction Quality to Customer Engagement
The interaction of consumers and producers on the platform will generate information, which is helpful for the platform to collect customer information and

obtain data, which will create economic value (Grange et al., 2020). A digital interactive platform (DIP) has been proposed by Ramaswamy & Ozcan (Ramaswamy & Ozcan, 2018), which indicates that businesses might generate value through interaction in addition to exchanging fixed products with customers. Deepening the relationship between customers and platform enterprises, as well as effective interaction between customers and opinion leaders, can improve the fit between customers and brands (Lawrence, 2013; Van Dijck, 2009). Interaction is the core of customer engagement (Hollebeek et al., 2014; Lawrence, 2013), Xue et al. (Xue et al., 2020) have proved that live interactions can promote the social commerce engagement. Yin et al. (Yin et al., 2023) have shown that presence has a positive effect on consumers' purchase intention. So, the interaction between opinion leaders and customers is particularly important for the study of customer engagement on social e-commerce platforms. Referring to the studies of Hollebeek (Hollebeek, 2011) and Brodie et al. (Brodie et al., 2011), this study proposed that customer bond can be divided into three dimensions: immersion, passion and vitality. The main characteristic of new media that has the potential to alter consumer perceptions and attitudes is interactivity (Zhang et al., 2015). The high-quality interaction between customers and opinion leaders enables customers to better understand the brand, feel happy, and influence their perception and behavior of the brand. In light of this, the following hypotheses are proposed in this paper:

H1a: Interaction quality of opinion leaders has a positive impact on immersion;

H1b: Interaction quality of opinion leaders positively affects passion;

H1c: The interaction quality of opinion leaders has a positive impact on vitality.

3.1.2. Customer Engagement to Platform Brand Value

Value co-creation theory believes that customers always participate in value co-creation (Vargo & Lusch, 2004), which means that customers can directly influence brand value. Jaakkola & Alexander (Jaakkola & Alexander, 2014) believe that customer engagement will affect the efficiency of value co-creation, and customers' preferences, information and other resources provided by enterprises and other stakeholders will affect the cognition or actions of other customers and stakeholders on the brand. The literature that is currently available highlights that platform indissolubility depends on customer engagement (Al-Debei et al., 2013; Hajli et al., 2015). Therefore, we believe that customer engagement may affect customers' evaluation of platform brand value. This paper divides platform brand value into three dimensions based on the research of Shen & He (Shen & He, 2018): brand functional value, brand emotional value, and brand social value. Customers will understand brand information and brand feelings better and be more willing to recommend the brand to other users through their own social networks when they are more actively engaged in brand-related interactive activities with opinion leaders on the platform. Customers are more satisfied with their perception of the value of the brand, more likely to have a positive brand experience, and more willing to share brand content when they enjoy engaging in

interactive brand-related activities. Customers' positive perception of a brand's value can be enhanced when they participate enthusiastically in interactive activities related to the brand. In light of this, the following hypotheses are proposed;

H2a: Immersion has a positive impact on brand functional value;

H2b: Immersion has a positive impact on brand emotional value;

H2c: Immersion has a positive impact on brand social value.

H3a: Passion has a positive impact on brand functional value;

H3b: Passion positively affects brand emotional value;

H3c: Passion has a positive impact on brand social value.

H4a: Vitality positively affects brand functional value;

H4b: Vitality positively affects brand emotional value;

H4c: Vitality has a positive impact on brand social value.

3.1.3. The Mediating Role of Customer Engagement

Customer engagement has been defined from two perspectives in the literature: the psychological, which emphasizes beliefs and behaviors, respectively (Bowden, 2009; van Doorn et al., 2010). Villanueva et al. (Villanueva et al., 2008) indicated that opinion leaders can influence other consumers' attitudes, beliefs, and actions by often sharing product knowledge and advice regarding purchase decisions with them. The existing literature emphasizes that customer engagement is essential for e-commerce to remain viable (Al-Debei et al., 2013; Hajli et al., 2015). The interaction between opinion leaders and customers about the brand may promote the engagement between customers and the brand, and then affect customers' perception of brand value. In value co-creation research, customer engagement is often used as a mediating variable (Gao & Huang, 2021; Zhang et al., 2015). In light of this, the following hypotheses are proposed in this paper:

H5a: Immersion plays a mediating role in the impact of opinion leader interaction quality on platform brand value.

H5b: Passion plays a mediating role in the impact of opinion leader interaction quality on platform brand value.

H5c: Vitality plays a mediating role in the influence of opinion leader interaction quality on platform brand value.

3.1.4. The Moderating Role of Prosumer Capability

Senior customers known as prosumers use their knowledge of the Internet and their social networks to actively engage in the development of products from concept to sale and use (Seran & Izvercian, 2014) Similar to consumer capability, prosumer capability refers to the total of a prosumer's knowledge, skills, and capability to actively participate in and co-create (Prahalad & Ramaswamy, 2004). Shen & He (Shen & He, 2018) indicated that prosumers with different abilities will have different perceived quality and influence, and there may be certain differences in the relationship between perceived interaction quality and brand value of opinion leaders. Jeppesen (Jeppesen, 2005) proved that customers with

high competence would participate more intensely in value co-creation activities, product development and upgrading, for intense. Besides, Shen et al. (Shen et al., 2023) found that prosumers capability played a moderating role in perceived prosumer content quality and perceived Interaction quality on co-creation intentions. Prosumer capability as a personal trait may moderate the impact of interaction quality of opinion leaders on customer engagement. Those with high prosumer capability can obtain brand information from the prosumption activities of ideal leaders and get closer to the brand. Based on this, the following hypotheses are proposed in this paper:

H6a: Prosumer capability moderates the mediating effect of "interactive quality of opinion leaders → immersion → platform brand value", and this effect is more significant under the condition of high producer and consumer competence.

H6b: Prosumer capability moderates the mediating effect of "interactive quality of opinion leaders → passion → platform brand value", and this effect is more significant under the condition of high producer competence.

H6c: Prosumer capability moderates the mediating effect of "interactive quality of opinion leaders → vitality → platform brand value", and this effect is more significant under the condition of high producer competence.

3.2. Research Model

Based on the above discussion, we built a relationship model between the interactive quality of opinion leaders and the brand value of the platform, as shown in **Figure 1**. The interaction between opinion leaders and users on brand will
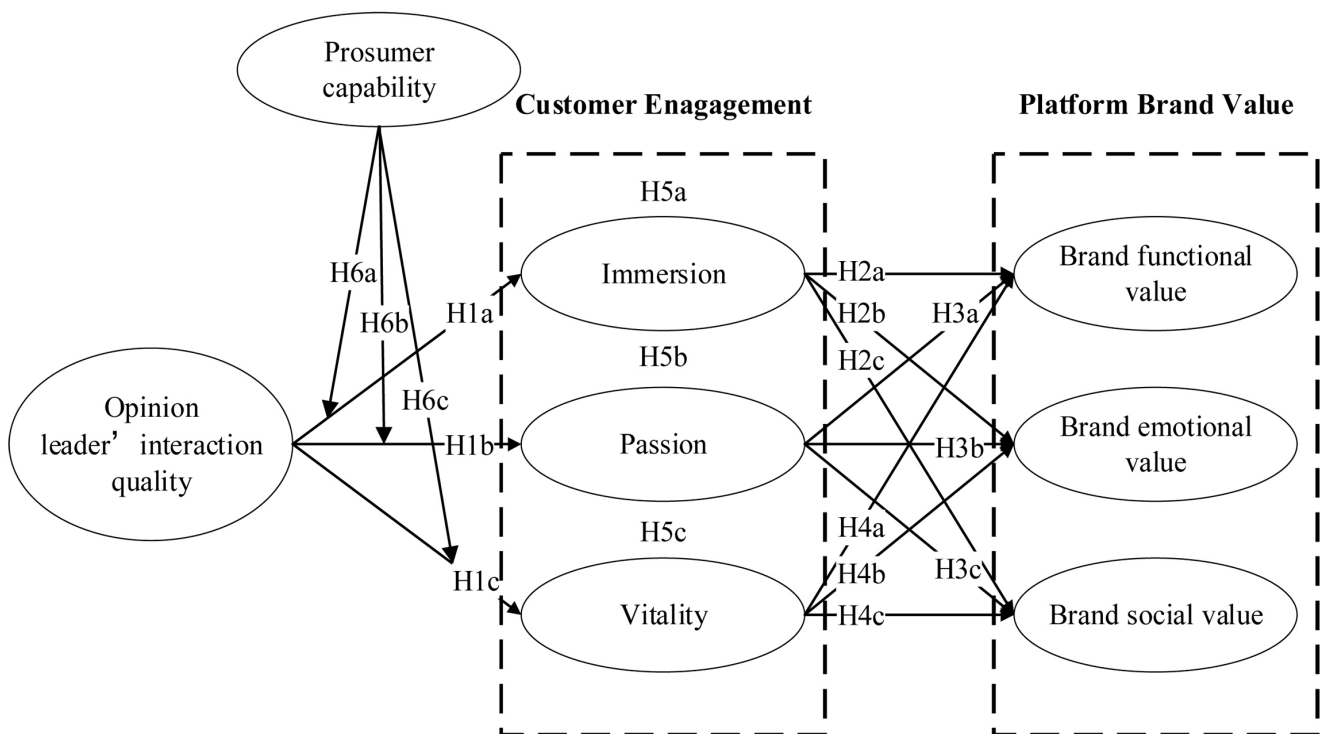

Figure 1. Research model.

produce customer engagement (Lawrence, 2013; Van Dijck, 2009) and customer engagement is the core of managing platform brand value (Ramaswamy & Ozcan, 2016). In the era of Web 2.0, customers have changed from consumers to consumers, and opinion leaders are the main consumers of the platform. The interaction of opinion leaders on the platform will affect the customer engagement of other users, thus improving the brand value of the platform. This will enable enterprises to deepen cooperation with opinion leaders, support their production and consumption activities, and ultimately improve the brand value of the platform.

4. Materials and Methods

4.1. Instrument

The pieces we utilized to design them were all modified from earlier works of literature to ensure content validity. Opinion leaders' interaction quality (IQ) was measured using four items adapted from Wang et al. (Wang et al., 2005). To measure customer engagement, we refer to Hollebeek (Hollebeek, 2011) and Brodie et al. (Brodie et al., 2011) points. Customer engagement was measured in three dimensions (conclude immersion, passion and vitality), selected immersion (IM), passion (PA) and vitality (VI) as the dimension, and each dimension included three items. Measurement items for platform brand value were adapted from the degree of brand functional value (BF), brand emotional value (BE) and brand social value (BS) (Bruhn et al., 2014; Keller, 1993; Shen et al., 2023). Measurement items for prosumer capability were adapted from Zou et al. (Zou et al., 2011) and Shen et al. (Shen et al., 2019).

We performed a back translation to make sure the translation was accurate because some of the original elements were written in English. and invited professionals with expertise in consumer behavior to evaluate the instruments' efficiency. In order to prove the instrument in concept, a pre-research was conducted to conceptually validate the instrument. A total of 70 pre-test questionnaires were received, and 64 valid questionnaires were received. Minor changes were made based on feedback. One item was deleted for CITI less than 0.4. Appendix A contains the completed questionnaire. A 7-point Likert scale, ranging from 1 (strongly disagree) to 7, was used to evaluate each item (strongly agree).

4.2. Date Collection

The respondents of this paper included users of Xiaohongshu, Douyin, and other social e-commerce platforms, which are popular in China and have a high number of active users and enterprises. The questionnaire was designed into three parts. The first part was related to the users' platform, including the usage duration, frequency, and other information. The second part was related to the measurement scale; independent variable (IQ), mediating variable (customer engagement), moderating variable (prosumers capability), and dependent variable (platform brand value). The last part dealt with the respondents' demographic information. Total 318 valid questionnaires were obtained out of 350

questionnaires, with an effective rate of 90.86%. The academic community generally requires that the number of questionnaires should be more than 5 times the number of valid questionnaires (Tinsley & Tinsley, 1987). The sample size collected in this paper meets this academic research standard. The demographic information of the final survey participants is shown in Table 1. Male and female proportions were 43.6% and 56.6%, respectively. A majority (75.5%) of respondents were between the ages of 18 and 30. Further, 68.9% of respondents had undergraduate or above and 53.2% of respondents were employed.

5. Data Analyses and Results

5.1. Reliability and Validity

Confirmatory factor analysis (CFA) was performed on the sample data to determine the dimensions of study variables and the reliability and validity of the sample data. The single-factor model analysis of IQ and PC indicates that the model fits the coefficient well. Each index (χ^2/df, RMSEA, GFI, NFI, IFI, CFI) all met the requirements (Hu & Bentler, 1999), so a single-factor model was adopted to measure IQ and PC. The single-factor and three-factor models of customer engagement and platform brand value are compared and analyzed, and it is found that the fitting index of the three-factor analysis model reaches a better level, and all indicators meet the requirements. Therefore, a three-factor model is adopted to measure customer engagement and platform brand value. Table 2 shows that each construct's Cronbach's α and complex reliability (CR) values were higher than

Table 1. Demographics of the survey respondents (N = 318). Source: Based on the questionnaire results of this study.

Demographics	Category	Frequency	%
Gender	Male	138	43.4
	Female	180	56.6
Age	≤18	22	7
	18 - 25	184	57.9
	26 - 30	56	17.6
	31 - 40	41	12.9
	≥41	15	4.6
Education	High school or below	34	10.6
	Two-year college	65	20.5
	Four-year college	133	41.7
	Graduate school or above	86	27.2
Occupation	Student	114	35.8
	Working	169	53.2
	Unemployed	34	10.7
	Others	1	0.3

Table 2. Results of confirmatory factor analysis. Source: Based on the empirical analysis of questionnaire data in this study.

Construct	Indicator	Standard loading	Cronbach's α	AVE	CR
Opinion leaders' interaction quality (IQ)	IQ1	0.837	0.928	0.765	0.929
	IQ2	0.871			
	IQ3	0.934			
	IQ4	0.853			
Immersion (IM)	IM1	0.678	0.762	0.507	0.753
	IM2	0.638			
	IM3	0.809			
Passion (PA)	PA1	0.828	0.833	0.643	0.844
	PA2	0.734			
	PA3	0.840			
Vitality (VI)	VI1	0.648	0.846	0.706	0.875
	VI2	0.929			
	VI3	0.913			
Brand emotional value (BE)	BE1	0.750	0.77	0.521	0.764
	BE2	0.652			
	BE3	0.758			
Brand functional value (BF)	BF1	0.780	0.724	0.504	0.752
	BF2	0.640			
	BF3	0.704			
Brand social value (BS)	BS1	0.748	0.749	0.507	0.755
	BS2	0.698			
	BS3	0.688			
Prosumers capability (PC)	PC1	0.789	0.781	0.712	0.925
	PC2	0.848			
	PC3	0.854			
	PC4	0.874			
	PC5	0.851			

the recommended threshold of 0.7, indicating that the reliability was satisfactory (Straub & Gefen, 2004). Convergent and discriminant validity were examined for construct validity. The average variance extracted (AVE) and indicator loadings were examined to demonstrate convergence validity. Table 2 illustrates this. As shown in Table 2., the standing loading value of observed variables in each measurement scale is greater than 0.6, and each observation variable factor can represent construct (Chin & Marcoulides, 1998). Every AVE measurement exceeded the recommended level of 0.5. This showed strong converging validity (Bagozzi, 1981).

By comparing the square root of the AVE of each construct with the correlation between that construct and other components, discriminant validity is evaluated. As can be seen in Table 3, AVEs (diagonal elements) have sufficient discriminant validity because their square root is bigger than the structural component correlation mentioned in the non-diagonal entries.

5.2. Structural Model Evaluation and Hypotheses Testing

AMOS23.0 was employed for our analysis of the proposed model. And then we examined the model fit indices of the structural model: $\chi^2/df = 2.228 < 3$, RMSEA = 0.067 < 0.08, GFI = 0.833 > 0.8, NFI = 0.880 > 0.8, IFI = 0.93 > 0.9, CFI = 0.93 > 0.9, TFI = 0.921 > 0.9, AGFI = 0.801 > 0.8. The structural model fits the date well. As shown in Figure 2, we supported twelve hypotheses. IQ had significant influence on customer engagement in IM ($\beta = 0.516$), PA ($\beta = 0.616$) and VI ($\beta = 0.630$), proving H1a, H1b, H1c, respectively. Furthermore, IM played a positive role in BE ($\beta = 0.741$), BF (0.781) and BS ($\beta = 0.649$), proving H2a, H2b, H2c, respectively. PA also had a more significant effect on BE ($\beta = 0.477$), BF (0.514) and BS ($\beta = 0.479$), proving H3a, H3b, H3c, respectively. VI had a positive predictive effect on BE ($\beta = 329$), BF (0.249) and BS ($\beta = 0.229$), proving H4a, H4b, H4c, respectively. Additionally, we discovered that IM had the greatest positive predictive effect on platform brand value.

5.3. Test of Mediating Effect

Bootstrapping approach was used to test the mediating effect of IM, PA and VI. For mediating effects, we used two step-process method which was indicated by Baron & Kenny (Baron & Kenny, 1986). At first, we assessed the conceptual without taking IM, PA and VI as mediators. We estimated the direct effect. And then, we estimated the indirect effect in which IM, PA and VI were entered as mediators. In a 95% bootstrap confidence interval, excluding zero. The mediating effect of the relationships between IQ on platform brand value (include BE, BF and BS) through IM, PA and VI is significant, as shown in Table 4. Besides, all paths (both the

Table 3. Results of discriminant validity testing. Source: Based on the empirical analysis of questionnaire data in this study.

	IQ	IM	PA	VI	BE	BF	BS	PC
IQ	0.875							
IM	0.508**	0.712						
PA	0.504**	0.709**	0.802					
VI	0.588**	0.693**	0.710**	0.840				
BE	0.406**	0.669**	0.715**	0.713**	0.722			
BF	0.270**	0.490**	0.339**	0.271**	0.392**	0.710		
BS	0.401**	0.633**	0.647**	0.705**	0.662**	0.360**	0.712	
PC	0.485**	0.647**	0.641**	0.741**	0.621**	0.118*	0.571**	0.844

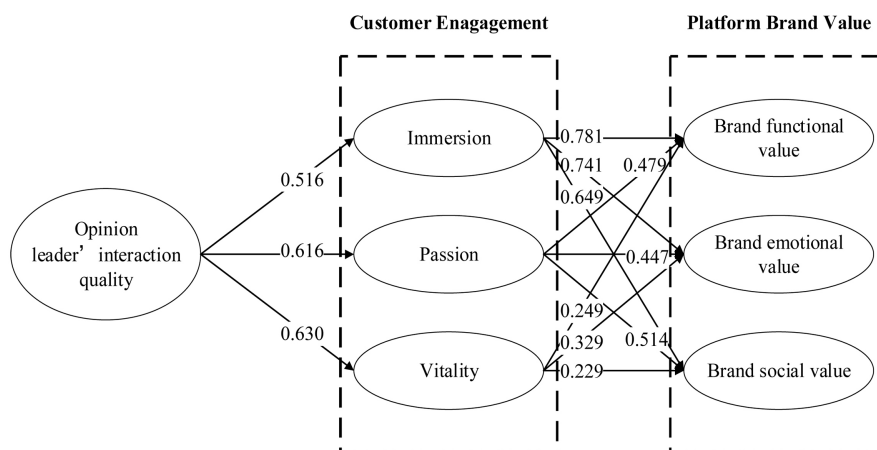$*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

Figure 2. The results of the structural model evaluation. Source: Based on the empirical analysis of questionnaire data in this study.

Table 4. Results of mediation analysis. Source: Based on the empirical analysis of questionnaire data in this study.

Mediation path	Indirect effect	CIs	Mediation
IQ → IM → BE	0.603	[0.408, 0.977]	Partial
IQ → IM → BF	0.317	[0.127, 0.518]	Partial
IQ → IM → BS	0.558	[0.173, 0.989]	Partial
IQ → PA → BE	0.331	[0.188, 0.452]	Partial
IQ → PA → BF	0.323	[0.269, 0.405]	Partial
IQ → PA → BS	0.348	[0.209, 0.521]	Partial
IQ → VI → BE	0.324	[0.150, 0.665]	Partial
IQ → VI → BF	0.349	[0.281, 0.414]	Partial
IQ → VI → BS	0.343	[0.156, 0.550]	Partial

direct and indirect) were statistically significant. So the results indicated that IM, PA and VI all partially mediate the effect of perceived IQ on platform brand value, sequentially supporting H5a, H5b and H5c.

5.4. Test of Moderating Effect

SPSS PROCESS (Model 17) (Bolin, 2014) was used to examine the moderating effect of PC in nine mediation paths, based on the partial mediating effect of IM, PA and VI.

First, the result indicated that the interactive effect of PC and IQ on IM was significant (β = 0.0904, p = 0.0001 < 0.001). This shows that the PC can moderate the predictive effect of IQ on IM. As shown in Figure 3, for high PC (M + 1SD), IQ had a positive effect on IM significantly (effect = 0.2938, t = 6.7705, p = 0.0000 < 0.001). For low PC (M-1SD), PC also had a positive effect on IM (effect = 0.0869, t = 2.1451, p = 0.327 < 0.05), though the effect is smaller. It means that a high PC will feel IM better as the PC improves in high IQ, while the low IQ will
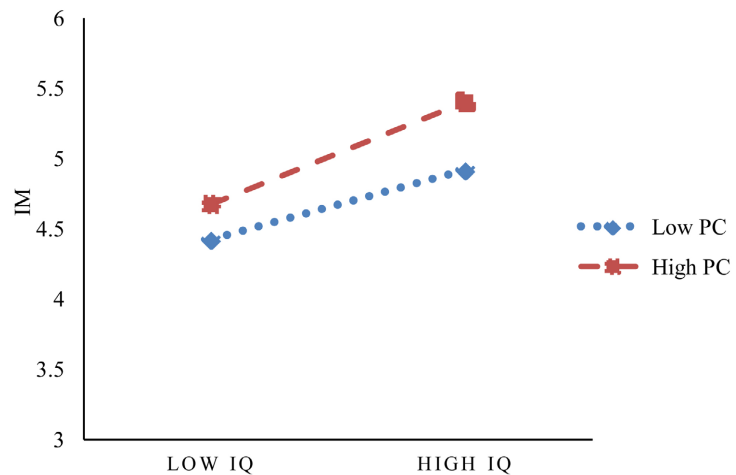
Figure 3. The moderating effect of PC on the IQ and IM. Source: Draw independently according to the empirical analysis results of this study.

fell IM less. The mediating effect of IM on platform brand value (BE, BF and BS) at different values of PC is shown in Table 5, the mediating effect on three dimensions of platform brand value in high PC is higher than the indirect effect in low PC. It indicated that with the improvement of PC, customers can feel IM better. And it can improve the mediating effect of IQ on platform brand value, and then improve the platform brand value, proving H6a.

Second, for H6b, the results indicated that the product of the IQ and PC had a significant negative effect on PA of customer engagement ($\beta = -0.0590$, $p = 0.0142 < 0.05$). This shows that PC can moderate the predictive effect of IQ on PA. As shown in Figure 4, for high PC (M + 1SD), IQ had a positive effect on PA (effect = 0.1106, t = 2.4289, $p = 0.0157 < 0.05$). For low PC (M-1SD), the positive effect became stronger (effect = 0.2460, t = 5.7860, $p = 0.0000 < 0.001$). It indicated that the effect of positive predictive was rising while the PC was declining. Table 6 shows the mediating effect of PA on platform brand value (BE, BF and BS) at different values of PC, the mediating effect on three dimensions of platform brand value in high PC is lower than the indirect effect in low PC. It indicated that with the improvement of PC, customers can feel PA less. This suggested that PC had a negative predictive effect on moderating IQ to PA. Thus, H6b was not supported.

Third, we put PC into the model with PA as the intermediary variable. The result showed that the product of IQ and PC has no significant effect on VI of customer engagement ($p = 0.3483 > 0.05$). And the confidence interval contained zero, PC did not modulate the predictive effect of IQ on PA. Thus, H6c was not supported.

In general, the moderating effect of PC on each intermediary path is different. In path "IQ → IM → Platform brand value", PC had a moderating effect. High PC can feel IM better in IQ, which can improve the IM's mediating effect on the relationship between IQ and platform brand value. In path "IQ → PA → Platform brand value", PC also had a moderating effect. However, High will feel PA less
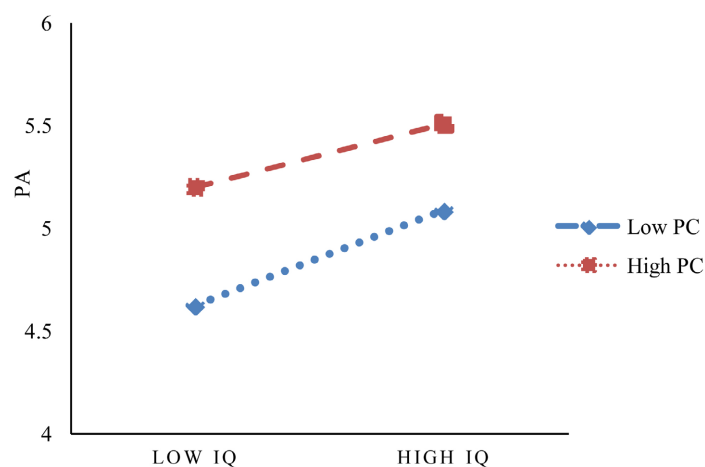
Figure 4. The moderating effect of PC on the IQ and PA. Source: Draw independently according to the empirical analysis results of this study.

Table 5. The mediating effect of IQ on platform brand value through IM at different values of PC. Source: Based on the empirical analysis of questionnaire data in this study.

IM	Dependent variable	Effect	BootSE	BootLLCI	BootULCI
M-1SD		0.0848	0.0353	0.0098	0.1490
M	BE	0.1857	0.0287	0.1248	0.2378
M+1SD		0.2866	0.0306	0.2218	0.3431
M-1SD		0.0620	0.0259	0.0080	0.1095
M	BF	0.1359	0.0256	0.0862	0.1859
M+1SD		0.2097	0.0341	0.1429	0.2756
M-1SD		0.0791	0.0331	0.0073	0.1373
M	BS	0.1733	0.0267	0.1162	0.2212
M+1SD		0.2647	0.0282	0.2072	0.3211

Table 6. Mediating effect of IQ on platform brand value through PA at different values of PC. Source: Based on the empirical analysis of questionnaire data in this study.

PA	Dependent variable	Effect	BootSE	BootLLCI	BootULCI
M-1SD		0.2212	0.0361	0.1437	0.2858
M	BE	0.1603	0.0373	0.0824	0.2298
M+1SD		0.0994	0.0433	0.0084	0.1792
M-1SD		0.1736	0.0305	0.1097	0.2295
M	BF	0.1259	0.0299	0.0624	0.1821
M+1SD		0.0781	0.0336	0.0068	0.1387
M-1SD		0.2223	0.0366	0.1410	0.2849
M	BS	0.1611	0.0378	0.0779	0.2276
M+1SD		0.0999	0.0437	0.0073	0.1783

in IQ, which will reduce the PA's mediating effect on the relationship between IQ and platform brand value. In path "IQ → VI → Platform brand value", PC didn't have a moderating effect.

6. Conclusion and Implications

6.1. Conclusion

With the rise of social e-commerce models based on user-generated content (UGC), the phenomenon of "production and consumption" is growing rapidly. IQ become the main marketing force of enterprises. This paper studied the influence of IQ on platform brand value from the perspective of prosumption logic, and examined the moderating effect of users' PC. To solve these problems, we constructed a moderated mediation model. Then we verified the accuracy of the model through questionnaire collection and empirical analysis. The results indicated that IQ had a positive impact on customer engagement in social e-commerce, and customer engagement also had a positive effect on platform brand value. Meanwhile, customer engagement played a significant mediating effect in IQ and platform brand value. Moreover, the mediating effect of IQ is more significant than the direct effect of IQ on platform brand value. In addition, the moderating effect of PC in each mediating pathway is different. In the IM pathway, PC plays a positive going moderating effect. And in the PA pathway, PC plays a negative moderating effect, while in the VI pathway, PC has no moderating effect. We can find out, IQ, customer engagement, platform brand value will be related to individual creativity.

6.2. Theoretical Implications

First, we constructed a research model combining IQ, customer engagement (IM, PA, VI) and platform brand value (BE, BF, BS) grounded on the logic of integration of prosumption. Among the research on social e-commerce platforms, there are few researches studied the influence of IQ on brand value of platforms from the perspective of prosumption. Previous studies have focused on the quality of information (Cheng et al., 2021; DeLone & McLean, 2003; Kim et al., 2017), technological environments (Zhang et al., 2015) and the impact of trust e-WOM (Seifert & Kwon, 2020). However, from the perspective of prosumption this study took IQ as an independent variable, customer engagement as a mediating variable, and PC as a moderating variable to explore the impact of IQ on platform brand value. This study formalized the relationship between platform brand value of IQ, which is beneficial to enrich the related research on prosumption and brand value.

Second, IQ positively affects customer engagement. Customer engagement also had a positive effect on platform brand value, which again confirmed the Jaakkola & Alexander (Jaakkola & Alexander, 2014) point of view. This study provided a new perspective of research, namely customer engagement. In terms of the influencing factors of customer engagement, this study refined the cus-

tomer groups, selected the opinion leaders with great influence among customers, and explored the influence of IQ on customer engagement, expanding the research on the leading factors in each field of customer engagement.

Third, we also revealed the regulatory role of PC. We revealed the different moderating powers of PC in each path, and explained how PC affects the role of IQ in customer engagement and thus brand value of the platform. From the test of the moderating effect, we can find that IQ, customer engagement and platform brand value are related to individual value creation capability, which is consistent with Jeppesen's (Jeppesen, 2005) previous research that individual ability difference will affect value creation activities. Previous studies ignored the influence of PC level on platform brand value, and this study also fills this gap.

6.3. Practical Implications

Our investigation frequently yields some crucial logical conclusions. In the era of Web 2.0, social e-commerce platform has gradually evolved into one that emphasizes content creation and interaction. Opinion leaders are of great value in content promotion of enterprise brands, product marketing activities and attracting platform users. This research also supported the beneficial effects of opinion leaders on platform brand value. A lot of social e-commerce platforms, like Xiaohongshu, Douyin, and Taobao, actively invite internet celebrities to produce content, start conversations with users, and collaborate with them. This efficiently promotes brand awareness and product sales. Based on this, platforms should attach importance to the influence of opinion leaders on social e-commerce platforms and take corresponding incentive measures to promote user creation and interaction (Vazquez et al., 2020; Yoo et al., 2010).

Second, we also examined the mediating role of customer engagement between IQ and platform brand value. In the process of participating in brand-related interactions, platform users will have positive psychological and behavioral states for brands, namely customer engagement (Hollebeek et al., 2014). Users are more likely to improve their recognition of the brand value of the platform after perceiving the engagement with the brand. The experience economy has progressively emerged as a result of the economy's rapid development, and experience-related marketing initiatives now center on it. Users will pay attention to the internal emotional experience that the brand or product brings, as well as the brand or product itself, in order to assess the impact of brand value. Therefore, social e-commerce platforms or enterprises should pay attention to users' internal emotional experiences. Digital technologies such as AR and VR can be used to enhance users' multi-faceted perception of brands and stimulate users' immersion, enthusiasm and vitality when platform users interact with opinion leaders or enterprises.

Third, the moderating effect of PC was investigated in connection to IQ, customer engagement, and platform brand value. The findings demonstrated that each pathway's PC regulation was affected differently. Prosumers was the unity of producers and consumers. The content they produce can be consumed by

other users, and other users can produce new content based on these contents, forming the integration of consumption and production (Ritzer, 2014). In the process, every platform user had the potential to become a powerful consumer. The research proved that users with different PC had different perceptions of IQ, and its effect on customer engagement and brand value of the platform was also different. Those with high PC felt more immersed and engaged from brand interaction with opinion leaders, thus improving the perceived brand value of the platform. Those with low PC felt more enthusiasm and pleasure from interaction, thus improving the brand value of the platform. Social e-commerce platforms or enterprises should make the effort to develop multi-level customers and provide different support services for consumers with different abilities. Enterprises can joint opinion leaders for high yield and eliminate the ability to provide more professional brand information and interactivity, and increase its immersive. At the same time, enterprises can also help the prosumers with high capability become opinion leaders and create more value. And for the prosumers with low capability, enterprise and opinion leaders can use a more pleasant form of interaction, let them feel enthusiasm.

6.4. Limitations and Future Research

This study has certain limitations, and various directions for future investigation are suggested. First, this study was primarily interested in social e-commerce consumers or opinion leaders, with emphasis on e-commerce and social networking. However, scholars' studies (Busalim et al., 2021; Sturiale & Scuderi, 2013; Zhou et al., 2013) also point out that there are many types of social e-commerce platforms with different operating methods. Therefore, the research results of this paper should be carefully extended to other social e-commerce platform environments. Future research could explore different operational approaches and types of platforms to demonstrate the universality of the findings. Second, the majority of the data in this paper was gathered through a questionnaire survey, and all items were evaluated by likert 7-level scale. There was still possibility for improvement in the quality of the measurement scale because there was no consensus on the scale of customer engagement and PC. At the same time, in the process of questionnaire survey, subjects' subjective scores on each measurement item may not fully reflect the real situation. Therefore, experimental methods, crawler data analysis and other research methods can be considered for future research. Finally, the integration of prosumption is the future development trend, but there is currently a scarcity of research on prosumption and prosumer (Shah et al., 2020). The measurement of PC is not mature enough and needs further improvement. Futurologists can explore the production and marketing activities of enterprises from the logical perspective of integration of production and consumption.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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