



Research on the Factors Affecting Customer Engagement in Social Commerce from the Perspective of Two-Factor Theory – Platform Comparison Between E-Commerce and Social Media

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Abstract: As a new type of business model, social commerce has attracted more and more attention from scholars. At present, there are few researches on customer participation, as the terminal of online commerce industry chain, customer is very important. Therefore, we propose a model, using the two-factor theory, to explore the influence factors of customer psychological engagement from two aspects of incentive and inhibition, as well as the effect of customer psychological engagement on subsequent participation behavior. The results show that both social support and self-congruence have a positive impact on customer engagement, while perceived social risk and perceived commerce risk have a significant negative impact on customer engagement, moreover, customer engagement is positively related to social sharing and purchase intention. In addition, this paper verifies the comparative effect of social commerce platforms. The results show that there are significant differences in social support and self-congruence between e-commerce and social media platforms.

Key words: Social commerce; Customer engagement; Self-congruence; Social Support; Perceived Risk; Platform comparison

1. Introduction

With the rapid development of the Internet, the demographic dividend of Internet customers is gradually decreasing, and the development speed of e-commerce enterprises is gradually slowing down. However, social media platforms represented by Facebook and Weibo can gather a large number of highly active and highly sticky customers in a short period of time, showing a strong development potential. Inspired by social networking sites, many enterprises integrate social media functions with e-commerce functions, and gradually form a new business model -- social commerce (Friedrich et al., 2019). Social commerce is defined as the use of Web 2.0 applications and social media to promote the interaction of individuals on the Internet to support

the process of customer purchasing products or services (Liang et al., 2014). Its goal is to provide some personalized services or products through network interaction (based on customers' preferences and interests) (Gibreel et al., 2018).

Social commerce can increase sales by providing customers with a more interactive shopping experience (Yadav et al., 2013). On social commerce websites, customers can share comments and suggestions about products or services and receive recommendations from other customers. Through communication and interaction, social commerce websites enable customers to obtain useful information so that customers can make better purchase decisions. Through the information on social commerce, customers on the Internet can also develop good social relationships with others, so that they can help others and offer advice during their purchase process (Ng, 2013). In this process, customers can also feel the fun of social networking without face-to-face communication, they can share information with each other and make collaborative shopping. Based on the change of such shopping mode, customers are gradually keen on obtaining information and shopping on social commerce websites.

The business model based on customer participation makes social commerce a rapidly growing way of online buying and selling. Customer engagement is a form of customer psychology and behavior, which is usually powerful in explaining and predicting the results of customer behavior (Arnould et al., 2009). High customer retention and engagement can promote business growth and increase profits (Shen et al., 2019). In the future, about 1/3 of the world's population will consume through social commerce platforms (Lu et al., 2016). This huge customer base provides opportunities for the development of Internet platforms.

The future of social commerce is not to be underestimated. However, there are still some problems in this field. First, although customer engagement can be used to measure platform competitiveness, fierce market competition and low switching costs of customers make it more difficult for a platform to attract customers' attention and participation (Campbell et al., 2013). In this respect, how to promote customer engagement is a crucial issue for both scholars and platforms. Second, there have been numerous literature studies on factors affecting customer engagement, such as

community factors and technology attractiveness (Braojos et al., 2019, Molinillo et al., 2020). However, most of the researches on customer engagement focus on the factors that have positive effects on customer engagement, and less on the factors that have negative effects.

Based on the current situation, this study attempts to solve the above challenges. Since the key success factor of social commerce is customer engagement (Sashi, 2012), it is necessary to explore the process of establishing customer engagement in depth from multiple perspectives.

The first research question of this paper is: which factors have a positive impact on customer engagement? What factors can negatively affect customer engagement? In addition, the different platforms on which customer engage on social commerce are also worth paying attention to.

Social commerce sites can be divided into two types: one is to add social functions to e-commerce platforms, and the other is to add e-commerce functions to social platforms (Gibreel et al., 2018). For example, Braojos et al. (2019) collected data from 100 companies' Facebook pages for empirical analysis. Molinillo et al. (2020) also used the customer base of Facebook social platform to explore the research on community drivers on customer engagement. However, most of the existing studies focus on a single social platform, and there is still no systematic study on the difference between the two types of social commerce platforms. For example, the business goal of e-commerce is to maximize the customer purchase rate, while the business goal of social media is to estimate the customer collaboration to create value. Although both types of platforms are social commerce sites, they are different in terms of business objectives, customer interaction, website design and so on. Based on this situation, the second research question of this paper is: do e-commerce and social media platforms have different impacts on customer engagement?

2. Literature review and hypotheses development

2.1 SOR theory

SOR theory is Stimulation-Organism-Response theory which is the basic theory in the field of customer behaviours. In the context of social commerce, stimulation(s)

means the environmental factors that stimulate the emotions of individuals (Mehrabian and Russell, 1974), such as community driven and personal factors. Organism refers to the inner mechanical state of individuals (receptional and emotional systems) in an environment, such as personal psychological states. Response means the active tendency and actual performance which show after ones are stimulated, such as purchasing behaviour, sharing behaviour, etc.

Intrinsically perceived emotions are usually caused by stimulating events, which can be natural phenomena, their own behavior, or the environment. Most customers due to external stimuli (S) or the influence of the internal body (O), and thus the subsequent specific participation behavior, and the mechanism of behavior and the SOR theory research problems have similarities, namely to give full consideration to the customer as the main body under the action of different stimulation will trigger customer behaviour as of the response(R). Therefore, it has certain feasibility and exploration significance to measure social commerce customer behavior by integrating SOR theory in this study. In this study, environmental factors of social commerce were defined as stimulus factors, customer participation was defined as organism, and response was defined as customer behavior.

2.2 Customer engagement

Customer-centered engagement is often used in fields such as sociology, psychology and organizational behavior. Existing literatures mainly study customer engagement from two perspectives. The first is to understand customer engagement from a one-dimensional perspective from the customer specific behavior (Shen et al., 2019, Wongkitrungrueng and Assarut, 2018). The second is to explore customer engagement from a multi-dimensional perspective from the customer psychological attitude (see Table 1). The breadth, depth and complexity of customer engagement can be better explained from a multi-dimensional perspective (Newman and Harrison, 2008). Therefore, this study continues the second approach mentioned above to explore customer engagement from a multi-dimensional perspective.

According to the service-oriented logic, customer engagement is a psychological state generated by the interaction with the focal agent or object in the service relationship,

which is jointly determined by the cognitive, emotional and behavioral dimensions of customers. Based on this, this paper customers second-order constructs (absorption, dedication and vigor) to measure customer engagement (Cheung et al., 2011). Absorption refers to the embodiment of customers' cognition and the state of their immersion and dedication when using social commerce websites. Dedication are the emotional level of interest, enthusiasm and inspiration shown by customers. Vigor is a behavioral measure of how much effort and time customers are willing to put into using a website.

As can be seen from the aforementioned literature, relevant situations or contexts have an impact on customer engagement from cognitive, emotional and behavioral dimensions. As for the factors that influence customer engagement, the existing literature mostly explores its positive effects from the perspective of community and individual. For example, Molinillo et al. (2020) found that community drivers have a positive impact on customer engagement, and Braojos et al. (2019) found that technological attractiveness has a significant positive impact on customer engagement through empirical analysis. Although some scholars have explored the negative factors affecting customer engagement, for example, Farivar et al. (2017) studied the direct impact of perceived risk on purchase intention and posting intention in the social commerce environment. However, there is little discussion on the negative factors that affect customer engagement in psychological state. Therefore, we will expand the two-factor theory to this field in the following, and explore the factors that affect customer psychological engagement from both positive and negative perspectives to help solve this problem.

On the whole, these three dimensions refer to the psychological state when customers interact, experience and consume on social commerce. This state may cause certain changes when customers use social commerce websites. For example, when customers think that the website is less secure, they may reduce their enthusiasm for using the website. Moreover, this change in customer engagement may also affect a series of customers' behaviors. When customers are less interested in the website, they may not share their experience on the website with friends, even if this sharing

behavior is very important for the development of social commerce enterprises. Therefore, for the social commerce, what factors will lead to the change of customer engagement and what behaviors will be affected by customer engagement will be the focus of the follow-up study in this paper.

Table 1. Different definitions of customer engagement in the literature

Authors	Concepts	Dimensions
Brodie et al. (2011)	Customer engagement	1. Cognitive; 2. Emotional; 3. Behavioral
Brodie et al. (2013)	Customer engagement	1. Cognitive; 2. Emotional; 3. Behavioral
Avnet and Higgins (2011)	Engagement	1. Cognitive; 2. Emotional; 3. Behavioral
Calder et al. (2009)	Online engagement	1. Stimulation & inspiration (E); 2. Social facilitation (E); 3. Temporal (C); 4. Self-esteem & civic mindedness (E); 5. Intrinsic enjoyment (E); 6. Utilitarian (C); 7. Participation & socializing (B); 8. Community (E)
Patterson and De Ruyter (2006)	Customer engagement	1. Cognitive; 2. Emotional; 3. Behavioral
Cheung et al. (2011)	Customer engagement	1. Cognitive; 2. Emotional; 3. Behavioral

2.3 Two-factor theory

2.3.1 Hygiene factors affecting customer engagement

In the field of information systems, the functional value of a product or organization can be classified as hygiene factors, which are the basic condition to judge whether customers will enter e-commerce (Liang and Lai, 2002) and also the factors that inhibit customers from using products or services (Cenfetelli and Schwarz, 2011).

In the context of social commerce, the higher the strangeness and uncertainty of customers to the environment, the more likely it is to affect the psychological state of customers, thus inhibiting the tendency of customers to use products or services. The customer's sense of uncertainty about the potential negative consequences of using a product or service, namely perceived risk (Farivar et al., 2018), is one of the most important and powerful concepts to explain customer behavior (Ashoer and Said, 2016b). Therefore, this study attempts to explore the impact of perceived risk on customer engagement in social commerce by using perceived risk as a hygiene factor.

Perceived risk is based on a comprehensive assessment of the uncertainty and severity of the action, it encapsulates the loss expectation associated with the action, and it is often psychologically considered to be likely to have negative consequences for the action (e.g., some online shopping actions). Farivar et al. (2018) believed that perceived risk could be divided into participation risk and business risk. Engagement risk refers to privacy risk and social risk, and is a customer's assessment of the potential negative consequences of an action (purchase or publish) on social commerce. For example, the engagement risk of e-commerce websites can be the risk of customers' disclosure of mobile phone number, purchase records, etc. The risk of participation in social networking sites can be revealing the real name, address, circle of friends and other information. Commerce risk is a comprehensive assessment of the potential negative consequences of shopping on social commerce, including risks in product and financial aspects (Farivar et al., 2017). For example, most of the customers' shopping accounts on e-commerce are associated with quick payment accounts. Once the accounts are stolen, certain losses will be caused. Accounts on social networking sites now also have the function of recharging members (such as

Weibo membership and WeChat wallet), which is related to the financial status of customers, which also has potential business risks.

2.3.2 Motivation factors affecting customer engagement

For social commerce, motivation factors are the key to determining whether customers participate in online interaction, as well as whether customers purchase from specific online stores (Liang and Lai, 2002). The following is the factors that may motivate customer engagement from an individual and social perspective.

From the individual point of view, the motivation of craving for recognition can be an important factor to stimulate the psychological changes of customers. The fundamental reason for individuals to match their self-identity with the image represented by the organization is to obtain the approval of others, which is the dominant role of self-consistency. Self-consistency is defined as “the degree of cognitive matching between consumers’ self-concept and product/organizational image” (Hosany and Martin, 2012) (Consumers’ cognition of themselves is self-concept (Fournier, 1998)), that is, consumers’ mental state when they compare their self-concept with the image or personality of an organization or brand (Zhang et al., 2016). Research shows that self-consistency can improve customers’ response to brand emotion, attitude and behavior (Aaker, 1999). Based on this, this paper tries to explore whether self-consistency can motivate customers to engage on social commerce.

From the perspective of social interaction, people tend to communicate and discuss product or service information with others in the context of social commerce, seeking opinions and feedbacks from social contacts, that is, seeking social support. Social support refers to an individual’s feeling of being cared for, responded to, and helped by people in a social group (Liang et al., 2014). When browsing websites, participating in online conversations can bring happiness to customers (Wolfenbarger and Gilly, 2001) and enable customers to obtain emotional social support (Liang et al., 2014). In addition, the information and suggestions provided by others can bring social support to customers on information. Due to the inherent sociality of social commerce (Doha et al., 2019), social commerce activities produce social interaction

behaviors and promote the generation of social support. Social support is an important indicator to measure customer engagement and positive behavior. Therefore, this paper tries to explore whether social support can motivate customer engagement on social commerce.

2.4 Customer behavioral intention

Under the background of social commerce, customer behavioral intention can be divided into social sharing intention and purchase intention. Social sharing intention is one of the main factors to measure social commerce activities (Chen and Shen, 2015), and it can represent consumers' tendency of social interaction behavior. On social commerce, the intensity of customers' sharing of information and shopping experience is called social sharing intention (Chen and Shen, 2015). According to the theory of consumer behavior, purchase intention refers to the tendency of customers to make a purchase decision for the products or services of social commerce websites, which is a behavioral tendency.

The reason for the occurrence of customers' behavioral intention can be explained as the change of customers' psychological state when they participate in the interaction of social commerce sites. When a customer browsing the site, customers participate in website can contact the enterprises or organizations to establish a powerful psychological, this increases the possibility of respond to the enterprise, the organization and its product (Islam and Rahman, 2017). The response can bring profits and create value for enterprises. Therefore, customer behavior intention research has been as one of the main focus in the field of commerce, is also one of the following research.

2.5 E-commerce and social media platforms

Customers often have two types of sites to choose from when they participate in a social commerce site. The difference between the two is the channel. The first type is to add social functions and elements on the basis of e-commerce platform (this first

type is hereinafter referred to as e-commerce platform or EC platform). For example, the “Ask Others” function launched by Taobao can facilitate the exchange of product information between potential consumers and other consumers. The second type is to add e-commerce elements on the basis of social media platforms (this second type is hereinafter referred to as social media platform or SM platform). For example, Facebook launched the “Buy Now” function to help enterprises increase product sales through news subscriptions, fan pages and instant messaging (Goodwin, 2016), so that enterprises can promote and sell on social media platforms.

First of all, from the perspective of business objectives, the first kind of social commerce websites based on e-commerce platforms emphasize the promotion of customers’ purchase behaviors. The second kind of social commerce site based on social media platform focuses on promoting customer interaction and creating value collaboratively. Second, from the perspective of customer interaction, the first e-commerce platform currently provides a lack of customer communication methods. For example, Taobao only has the function of comment and publishing pictures. The second kind of social platform now has rich interactive functions, such as comment, forward content, notify friends and so on. In addition, from the perspective of website design, e-commerce platforms tend to display detailed information such as commodities and prices. Social media platforms, on the other hand, tend to present customers’ perspectives. To sum up, e-commerce and social media platforms are significantly different from each other from multiple perspectives. The follow-up will explore whether these differences have different impacts on customer engagement.

3 Hypothesis and research model

3.1 Self-congruence

As a kind of e-commerce brand, social commerce website is also a kind of enterprise that consumers will make psychological comparison to. Customers’ participation in and use of websites/services aims to convey the personal symbolic significance of this website/service to consumers, and such symbolic consumption can improve individuals’ self-concept and finally guide customers' behavior (Grubb and Grathwohl, 1967). Because of this need for self-consistence, customers can make a psychological

comparison between their self-concept and the image of the website. Consumers will experience a high degree of self-consistence if they believe that the image of the website matches their own image, or the image that other individuals want it to achieve. Zhang et al. (2016)) believe that a high level of self-consistence indicates that there is a good match between customers and enterprises or brands, which will bring customers a sense of happiness and satisfaction and affect customers' cognition and emotion, thus encouraging them to participate in social commerce websites. That is to say, the degree to which a customer's self-concept matches the image of a typical customer on a website will influence customer behavior. For example, many customers will buy high-value brands as a symbol of their identity (Pansari and Kumar, 2016), or will participate in website interaction. When comparing self-concept with social commerce websites, if customers realize they have high self-consistence, it means there is a good match between customers and social commerce websites, which may increase the participation of customers of social commerce. Therefore, the following hypotheses are proposed:

H1: On social commerce platforms, self-consistence has a positive impact on customer engagement.

3.2 Social support

Aladwani (2018) found that the quality of social support has a significant impact on customer engagement in social business (Xu et al., 2012). People need social communication to meet their needs for social belonging and support (Liang et al., 2014). Both emotional social support and support from information sources are social values brought by social commerce for customers, as well as a way for individuals to establish intimate relationships with others and enhance their personal happiness (Liang et al., 2014). When customers benefit from social support, they are likely to develop a sense of mutual responsibility that leads them to provide support to other community members (Shumaker and Brownell, 1984), and when they establish personal connections with others, they can get the feeling of contact with others through the site, which increases the social presence of customers and will eventually lead to the increase of the use behavior of the site (Xu et al., 2012). Moreover, social

interaction on online social platforms will also have a positive impact on customer engagement on online social platforms (Cheung et al., 2011). Therefore, it can be assumed that:

H2: On social commerce platforms, self-consistence has a positive impact on customer engagement.

3.3 Perceived risk

Decision field theory holds that risk is an important consideration in decision making, because in the process of online shopping, the biggest obstacle is risk (Friedrich et al., 2019). Bauer (1960) believes that the risk in the real world is not the factor that affects customer behavior, but the subjective perception of possible risks by customers. Such perception is a variety of concerns associated with behavior, and perceived risk plays a more important role than positive factors in influencing customer behavior (Tversky and Kahneman, 1992), which is more common in the social commerce environment. Whether the products/services purchased may be harmful is a customer's perceived risk (Stone and Grønhaug, 1993). Typical social commerce behaviors (purchasing and posting comments) are also likely to bring some risks to customers, which may hinder customers' participation in social commerce activities (Farivar et al., 2017) and seriously affect the decision-making results. Ashoer and Said (2016a) also believed that even if customers do not know whether the perceived risk will occur, the higher the risk they perceive psychologically, the more it will become one of the major obstacles to making decisions. In addition, risk is also an important factor affecting social interaction (Doolin et al., 2005). Therefore, this paper proposes the following hypotheses:

H3: On social commerce platforms, perceived engagement risk has a negative impact on customer engagement.

H4: On social commerce platforms, perceived business risk has a negative impact on customer engagement.

3.4 Social sharing intention

The behavior of customers contributing information is the basis of information exchange among consumers (Phang et al., 2009). If a customer has emotional attachment and feelings to a social commerce site, such as being fully involved in the use of the site and feeling the excitement of using the site, then he/she is likely to recommend the site to his/her friends and family, or provide them with some information feedback (Liang et al., 2014). When customers are willing to invest time and energy into the website, have a strong interest in the website, and feel enthusiasm and significance from the platform, they will have a tendency to generate certain information in the process of using the website, such as browsing, thumb up, comments, etc. Aksoy et al. (2013) also believe that active customers who participate in the website can provide some valuable information in the Internet, such as the advantages and disadvantages of goods, the needs of customers and so on. Similarly, customer engagement can improve the possibility of evaluating products and services, which will also have a positive impact on word-of-mouth (Cheung et al., 2011). Therefore, this paper proposes:

H5: On the social commerce platforms, customer engagement has a positive impact on customers' social sharing intention.

3.5 Purchase intention

Scholars believe that there is a significant influence relationship between state input and behavioral input (Macey and Schneider, 2008). Customer engagement is a state input and social sharing and purchase are behavioral input. Oliver (1999) proposed that in the process of belief- attitude-behavior, consumers who are engaged in the state may change the process from state to behavior faster, and customer engagement is also a psychological process leading to the formation of loyalty (Brodie et al., 2013). Therefore, customers who actively participate in social commerce platforms are likely to make purchases. Cheung et al. (2011) also believe that customer engagement in the state should have a positive impact on specific engagement behaviors. Moreover,

customers who participate in the website from the state are more satisfied with the social commerce website than other customers (Brodie et al., 2013), that is to say, customers are more willing to put their personal energy (from the emotional and cognitive aspects) into an online social platform, so he/she is more inclined to participate in the activities on the online social platform in action. Therefore, this paper proposes:

H6: On the social commerce platform, customer engagement has a positive impact on customers' purchase intention.

3.6 Differences between e-commerce and social media platforms

When customers use social commerce websites, there will be obvious differences in the goals of using EC and SM platform (Hollenbaugh and Ferris, 2014, Huang and Benyoucef, 2013). The main purpose of customers using e-commerce websites is to shop efficiently and to interact with others less. The main goal of using social media websites is to face the society more and interact with others. When using social commerce websites, customers will experience a high degree of self-consistence if they think that the website image conforms to their own image or the image that other individuals want it to achieve. That is to say, the customer's judgment on this self-consistence will be influenced by others. Because customers have more social interactions in social media and are more vulnerable, the hypothesis is put forward:

H7a: Compared with e-commerce websites, the self-consistence of social media websites has more significant influence on customer engagement.

In the earliest e-commerce websites, there is no social interaction section (for example, customers who have already purchased cannot post comments). When customers use traditional e-commerce websites, they are in a state of no communication (similar to isolated islands), and the information they can obtain is only pictures and words published by merchants, so it will be difficult for customers to make appropriate choices. After adding social elements to the e-commerce website, customers who have not communicated can establish their relationship through social interaction and social

support exchange, breaking the original island state, which can greatly affect their decision-making behavior (Liang et al., 2014, Ng, 2013). The starting point of social networking sites is to promote the communication between customers. Compared with the qualitative change of social interaction of e-commerce platform, customers can buy goods more easily after adding e-commerce elements to social networking sites, but there is no great change in the way of information exchange and information flow transmission between customers. In addition, at present, all social networking sites have not realized the true identity authentication of customers. This situation makes customers communicate more carefully when they communicate on social platforms, in order to protect their own information, thus affecting their engagement behavior. That is to say, engagement status of customers in the second case may be weaker than that in the first case. Therefore, this paper puts forward the hypothesis:

H7b: Compared with social media websites, the influence of social support on customer engagement on e-commerce websites has more significant influence.

When customers use social media websites, a lot of websites do not use real-name system. For example, Xiaohongshu can be used by only registering with a mobile phone account and even using WeChat to log in. However, on many e-commerce websites, every customer must register an account with an ID number before using the e-commerce website. Once the customer violates the rules, the website can impose penalties to the account. This mechanism ensures the security of customers participating in social interaction. Moreover, unlike everyone on social media websites, e-commerce websites can also interact anonymously, which greatly reduces the possibility of revealing the true identity of customers and the engagement of customers. Surveys show that around 52% of Google customers and 70% of Facebook customers are somewhat or very concerned about privacy when using services (PCMag.com, 2011), which could hamper the growth of social media-based social commerce websites. The research results of Bansal and Chen (2011) also show that compared with social media, online shopping websites/stores have stronger security and better privacy system. In addition, Wamba (2014) believe that these risks may be higher in social media platforms due to the high network externality of social media,

and customers will generally trust e-commerce websites more (Bansal and Chen, 2011), which leads to the difference in perceived risks between e-commerce and social media. Therefore, we assume that:

H7c: There are significantly differences between e-commerce and social media platforms in the impact of perceived engagement risk on customer engagement.

H7d: There are significantly differences between e-commerce and social media platforms in the impact of perceived commerce risk on customer engagement.

3.7 Research model

As mentioned earlier, on social commerce websites, self-congruence will make customers feel similar to websites, and have certain satisfaction with using websites, thus prompting customers to continue using social commerce websites. The social support that customers feel in social commerce will also make customers psychologically satisfied with the website. Based on the two-factor theory, motivation factors are related to satisfaction. Therefore, self-congruence and social support mentioned above are classified as motivation factors.

When a customer visits a social commerce website, if the perceived risks (i.e., engagement risks and commerce risks) are high, customer will have a certain degree of resistance, and their satisfaction with the social commerce will be greatly reduced, and they will even not visit the website anymore. Because hygiene factors are related to dissatisfaction, this paper divides perceived engagement risk and perceived commerce risk into hygiene factors. Hygiene factors can reduce the dissuasion effect caused by uncertain information, thus restraining customers' non-engagement behavior. Based on the foregoing and existing literature, we developed a conceptual model of customer engagement in online social commerce platform. The research model of this paper is shown in the following figure:

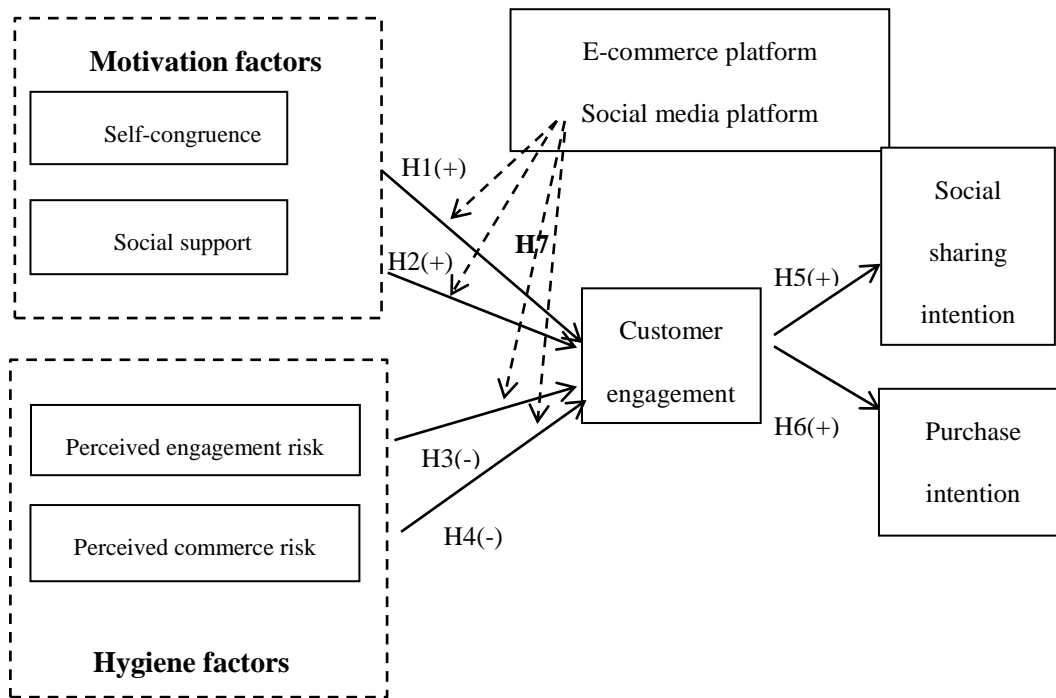


Fig. 1 Research model

4. Methodology

4.1 Data collection

According to the research model proposed in this paper, we use questionnaire survey to collect data. In the experiment, the subjects were divided into two groups. They browsed the product purchase pages of social platforms (Weibo, Xiaohongshu) and e-commerce platforms (Pinduoduo, Taobao), and were required to browse at least five interactive sections of products. After the experiment, the subjects fill in the questionnaire. The questionnaire is divided into two parts. The first part is the explanation part, which mainly introduces the origin and purpose of the questionnaire. The second part is the basic information of the investigator. The third part is the measurement scale, which consists of 45 items in each construction. The 7-point Likert scale is used to measure it. From 1 point to 7 points, it means “totally disagree” to “very agree”(as shown in Appendix).

Before formally collecting the questionnaire, we made a preliminary survey. After the experiment, 82 subjects put forward relevant opinions on the structure and text description of the questionnaire. According to the questions collected in the

pre-investigation, the authors revised the wording of the questionnaire and deleted some measurement items. In the formal survey, 866 subjects participated in the survey. After screening the collected questionnaires, we obtained 824 valid questionnaires, accounting for 95.15% of the total number.

4.2 Descriptive statistical analysis

Before the empirical analysis, we first conducted descriptive statistical analysis on the sample data to investigate the demographic characteristics of the sample, such as gender, age and educational background, as shown in Table 2. Among them, most of the subjects are women, and the main age range is 18-25 years old; most of the subjects are undergraduates, and most of them have 4-7 years of online shopping experience. Most of them buy goods online 1-5 times a month, which shows that most of them have rich online shopping experience.

Table 2. Descriptive statistical analysis

Basic information		Frequency	Percentage
gender	male	339	41.1%
	female	485	58.9%
age	under 18	9	1.1%
	18-25	516	62.6%
	26-32	195	23.7%
	33-45	81	9.8%
	over 45	23	2.8%
educational background	junior middle school or below	5	0.6%
	high school	69	8.4%
	bachelor degree	580	70.4%
	master degree	165	20%
	doctor degree or above	5	0.6%

years of online shopping	less than one year	19	2.3%
	1-3 years	275	33.4%
	4-7 years	440	53.4%
	8-10 years	72	8.7%
	over 10 years	18	2.2%
the frequency of online shopping	average once a day	475	57.6%
	average once a week	274	33.3%
	average once a month	70	8.5%
	less	5	0.6%

4.3 Reliability and validity of the scale

In this paper, AMOS 24.0 is used to verify whether the model in this paper has common method bias (Podsakoff et al., 2003). A confirmatory factor analysis model M1 and a model M2 with potential method factors are constructed, and the fitting indexes of the models M1 and M2 are compared. The results show that $\Delta \chi^2/df=0.034$, $\Delta SRMR=0.0138$, $\Delta TLI=0.001$, $\Delta CFI=0.001$, $\Delta RMSEA=0.001$. It shows that the model has not been improved obviously after adding the common method factor, thus there is no obvious common method deviation in the measurement.

In addition, KMO test and Bartlett test showed that KMO value was $0.956 > 0.5$, Bartlett test significance was $0.000 < 0.05$, which indicated that the scale was suitable for factor analysis. According to the two-step procedure of Anderson et al. (1988), the measurement model should be checked before modeling. This study analyzes the reliability and validity of the scale. We can see from Table 3 that Cronbach's α of all constructs is greater than 0.8, which indicates that all constructs have good internal consistency and the scale has high reliability. According to the research of Thompson (2004), this paper carries out confirmatory factor analysis (CFA) on all constructs of the model. Table 3 shows that the factor loads of all constructs are greater than 0.6, thus they are all significant. The combination reliability of all constructs is greater

than 0.8, and the average variance extraction (AVE) is greater than 0.5, which indicates that the scale has good convergence validity. In addition, to test discriminant validity, we compared the square root of AVE for each construct with the correlations between that construct and all others. The result shows that it is higher than all the corresponding correlations.

Table 3. Convergent validity and internal consistency reliability

Constructs	Items	St. Coef	α	CR	AVE
Self-congruence	Sc1	0.762	0.856	0.858	0.601
	Sc2	0.770			
	Sc3	0.761			
	Sc4	0.807			
Social Support	SS1	0.800	0.880	0.881	0.650
	SS2	0.808			
	SS3	0.845			
	SS4	0.769			
Perceived Engagement Risk	PER1	0.787	0.869	0.870	0.574
	PER2	0.800			
	PER3	0.823			
	PER4	0.686			
	PER5	0.682			
Perceived Commerce Risk	PCR1	0.815	0.892	0.893	0.624
	PCR2	0.799			
	PCR3	0.779			
	PCR4	0.768			
	PCR5	0.789			
Absorption	Ab1	0.710	0.871	0.872	0.577
	Ab2	0.744			
	Ab3	0.747			

	Ab4	0.790			
	Ab5	0.802			
Dedication	De1	0.731	0.801	0.801	0.502
	De2	0.680			
	De3	0.716			
	De4	0.705			
Vigor	Vi1	0.757	0.871	0.872	0.577
	Vi2	0.718			
	Vi3	0.758			
	Vi4	0.784			
	Vi5	0.778			
Social Sharing Intention	SSI1	0.762	0.835	0.835	0.629
	SSI2	0.807			
	SSI3	0.809			
Pursuaing Intention	PI1	0.780	0.822	0.823	0.608
	PI2	0.751			
	PI3	0.807			

4.4 Results

In this paper, AMOS 24.0 is used to evaluate the research model. The fitting indexes of the model are as follows: $\chi^2/df = 3.640$, SRMR=0.0490, CFI=0.914, TLI=0.907, RMSEA=0.057, and all the indexes of the model meet the standards (Hooper et al., 2008). Then, the above assumptions are tested.

The standardized path coefficient and significance of the model are shown in Figure 2, which confirms the influence of four constructs on customer engagement. The research shows that self-congruence positively affects customer engagement ($\beta = 0.628$, $p < 0.001$), and thus H1 was supported. Social support has a positive effect on customer engagement ($\beta = 0.298$, $p < 0.001$), and H2 holds. Perceived engagement risk negatively affects customer engagement ($\beta = -0.092$, $p < 0.05$), H3 holds.

Perceived commerce risks have a negative effect on customer engagement ($\beta = 0.130$, $p < 0.001$), and accept H4. From the significant results, perceived commerce risks have a stronger negative impact on customer engagement than perceived engagement risks. In addition, customer engagement has a significant positive impact on social sharing intention ($\beta = 0.842$, $p < 0.001$) and purchase intention ($\beta = 0.840$, $p < 0.001$), that is, both H5 and H6 hold true.

In order to verify the moderating effect of social commerce website types on the model, we divided sample into two groups: e-commerce group and social media group, and the model is regressed within groups. As shown in Table 5, the types of social commerce websites play a moderating role on the positive impact of self-consistence on customer engagement ($p = 0.009 < 0.01$). From the perspective of path coefficient, compared with e-commerce websites, the self-consistence of social media websites has a more significant impact on customer engagement ($\beta_{ec} = 0.574 < \beta_{sm} = 0.734$), that is, H7a is accepted. In the process of positive impact of social support on customer engagement, the types of social commerce websites also play a regulatory role ($p = 0.009 < 0.01$). Compared with social media websites, the social support of e-commerce websites has a more significant impact on customer engagement ($\beta_{ec} = 0.345 > \beta_{sm} = 0.189$), that is, H7b is accepted. There is no significant difference between e-commerce group and social media group in perceived engagement risk and perceived commerce risk on customer engagement ($p_{PER} = 0.409 > 0.05$, $p_{PCR} = 0.337 > 0.5$), that is, H7c and H7d are rejected.

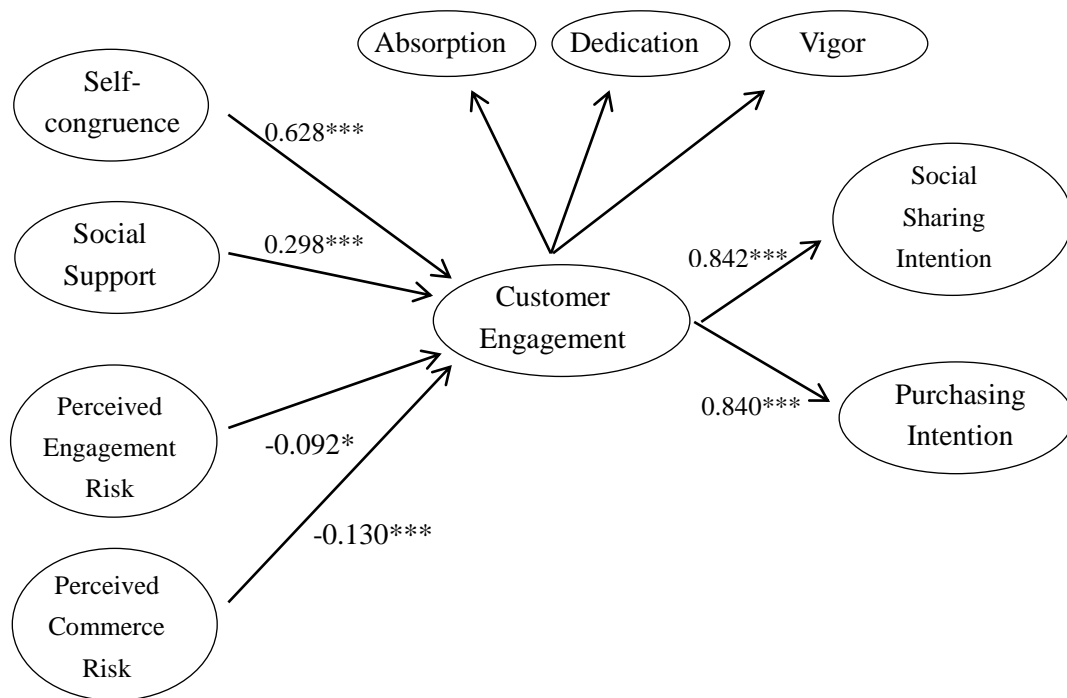


Fig. 2 Analysis results of the model

5. Results and discussion

5.1 Theoretical contribution

This paper has practical implications for the research in the field of social commerce. First of all, previous researches on social commerce mostly focused on the design of social commerce websites. The research model of this paper combines social factors and risk factors to discuss the impact on customer engagement, which enriches the literature content of social commerce to a certain extent. The results show that customers' perceived self-consistence can positively influence customer engagement, which indicates the importance of self-consistence for customer engagement. In addition, social support has a significant positive impact on customer engagement, which is consistent with the research results of (Molinillo et al., 2019).

Most of the previous studies focused on the factors that have a positive impact on customer engagement. However, people tend to be more cautious in the face of risky things, so negative factors should not be ignored. One of the research focuses of this paper is the negative impact of customer's perceived engagement risk and perceived

commerce risk on customer engagement. The research results show that customers' perceived engagement risk and commerce risk have a significant negative impact on customer engagement, which also proves that social commerce customers are willing to avoid risks. If there are certain risks when using social commerce websites, this will affect customer engagement in websites. This research conclusion provides a certain reference for the further study of customer behavior in the future.

This paper divides social commerce platform into e-commerce platform with social function and social media platform with e-commerce function and verifies the moderating effect of social commerce platform. The results show that the platform type plays a moderating role in the positive impact of self-consistence on customer engagement, and the e-commerce platform has a more significant impact on it. This is because customers' judgment of self-congruence will be influenced by others, and customers' social interaction in social media is more than that of e-commerce websites. Therefore, self-congruence of social media platform has a more significant impact on customer participation. When social support positively affects customer engagement, it is the social media platform that has a more significant impact on it. It is because social media platform is formed from strong ties consisting of friends or familiar people. They can perceive much stronger social support than that from e-commerce website which is formed from weak ties where people are strangers to each other. This series of studies shows that different platform types have different moderating effects on customer engagement, which also provides theoretical support for the literature of social commerce platform comparison.

In this paper, three first-order variables are used to measure customer engagement. The research results verify that customer engagement has a significant positive effect on customers' social sharing intention and purchase intention. That is to say, customers' perception of websites from three aspects: cognition, emotion and behavior promote customers' sharing behavior with other social contacts, and can also promote customers' purchase willingness. In previous studies, few scholars measured customer engagement from three dimensions, which enriched customer engagement literature, and also enabled people to better understand the relationship between customer

engagement and social sharing willingness and purchase willingness.

5.2 Practical significance

The results of this study have significant implications for social commerce operators. In the marketing process, social commerce enterprises need to accurately locate their own image, find suitable customers, and use certain marketing method to make the target people feel self-consistence with the enterprises, to promote the engagement of customers on social commerce websites. For example, by analyzing customer data, the functions of the website are formulated according to the characteristics of core customer portraits, so that the target customers have higher self-consistence with the website psychologically. Similarly, because social support has a positive impact on customer engagement, social commerce websites can provide creating multiple communication sections to enable customers get social support during their purchasing process, thus improving customer engagement.

Social commerce websites should pay attention to the risk management of websites while using marketing methods to improve customer engagement. Because the engagement risk perceived by customers will negatively affect customer engagement. When customers feel that there is certain engagement risk on this social commerce website, they will try their best to reduce their engagement on the website for the psychological reason of avoiding risks. Therefore, websites should try their best to take measures to reduce engagement risk perceived by customers, for example, in the information display situation that allows customers to freely choose their homepage, by reducing the exposure of private information to reduce the engagement risk. Moreover, because customers' engagement is also negatively affected by customer perceived business risks, social commerce websites should avoid the loss of property and theft of payment accounts that customers may face in the process of using websites, so as to reduce customer perceived business risks.

Nowadays, there are a large number of social commerce websites, but only a few can stand out. When designing the functions of social commerce websites, enterprises

need to consider the differences between different types of social commerce websites. The results of this study show that e-commerce websites with social functions can promote the positive influence of self-consistency on customer engagement. That is to say, enterprises can consider positioning customers more accurately in e-commerce websites with social functions, so as to enhance customers' perceived consistency between themselves and websites. In addition, social media websites with e-commerce website function can strengthen the positive impact of social support on customer engagement, which also suggests that this type of website should pay attention to the social section of the webpage to enhance the social support perceived by customers, so as to improve customer engagement.

5.3 Limitations

This paper has some limitations in the research process. First of all, most of the subjects are university students, which influences the generalization of this study. In future research, the sample data should be evenly distributed in all age and career groups as far as possible, so as to make the research results more representative. Secondly, the consideration of customer behavior in this paper is limited, only social sharing and purchase intention are considered, and other customer behaviors are not considered (such as customer repurchase willingness, customer interaction behavior, etc.). In future research, more complete consideration should be given to the construction of the model.

Appendix

Table 4. Questionnaire

Factors	Measures	Sources
Self-congruence	Sc1 I think the site is very close to my own personality Sc2 I use the site to identify myself Sc3 What kind of personality can I use this site to express to others Sc4 was positioned very well for me	Escalas and Bettman (2003), Ha and Im (2012)

<p>Social Support</p>	<p>SS1 When I had a problem, some people on the site poured out my feelings.</p> <p>SS2 When I had a problem, some people on the site comforted and encouraged me.</p> <p>SS3 When I have a problem, some people on the site show interest and concern for my health.</p> <p>SS4 When I have a problem, some people on the site help me find the reason and give me advice.</p>	<p>Liang et al. (2014), Hajli et al. (2015)</p>
<p>Perceived Engagement Risk</p>	<p>PER1 Providing my information to this website may cause me to lose control of my information privacy.</p> <p>PER2 Provide my information to this website, my personal information may be used without my knowledge.</p> <p>PER3 By providing my information to this website, hackers (criminals) may control my information and use it for other purposes.</p> <p>PER4 Commenting on the site may affect others' views of me.</p> <p>PER5 Commenting on the site, I would worry about what people who are valuable to me would think of me if I made a wrong choice.</p>	<p>Cocosila and Turel (2015), Gupta et al. (2004), Turel and Gefen (2015)</p>
<p>Perceived Commerce Risk</p>	<p>PCR1 Compared with other shopping methods, buying products from this website will involve more product risks (such as buying products that cannot work or are defective).</p> <p>PCR2 I may lose money if I buy goods from this website.</p> <p>PCR3 There is a risk that I am not satisfied with the product, service or delivery when I purchase goods from this website.</p>	<p>Cocosila and Turel (2015), (Tom et al., 2007)</p>

	<p>PCR4 It's a bad way for me to spend money to purchase goods from pcr4.</p> <p>PCR5 When buying goods from this website, I will worry about whether my money is worth it.</p>	
Customer engagement-t-Absorption	<p>VI1 when I participated in the website, I felt very strong and energetic.</p> <p>Vi2 for this website, I feel very energetic in spirit.</p> <p>VI3 in the website, even if things are not going well, I always insist on using it.</p> <p>VI4 I spent a lot of time on the site.</p> <p>Vi5 I do my best to perform well on the site.</p>	Cheung et al. (2011)
Customer engagement-t-Dedication	<p>DE1 the site inspired me.</p> <p>De2 I found the site full of meaning and purpose.</p> <p>DE3 When I use the site, I'm excited.</p> <p>De4 I'm proud to use the site.</p>	Cheung et al. (2011)
Customer engagement-t-Vigor	<p>Ab1 Time flies when I participate in the website.</p> <p>AB2 Use of the site was so attractive that I forgot everything else.</p> <p>AB3 When I use the site, I'm less distracted.</p> <p>Ab4 I am immersed in this website.</p> <p>AB5 When I use the site, my attention is focused.</p>	Cheung et al. (2011)
Social Sharing Intention	<p>Ssi1 I would like to reply to other comments on this website.</p> <p>After purchasing</p> <p>SSI2 On this website, I would like to share product information on other social networking sites.</p> <p>Ssi3 When my social network contacts need advice, I would like to recommend the site.</p>	Verhagen et al. (2017)
purchase	Pi1 I think the website provides a good opportunity for	Hsiao et al.

intention	shopping and I will consider buying products on the website. Pi2 I may purchase products on this website. Pi3 I would like to buy products on this website.	(2010)
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