


Article

How Attachment and Community Identification Affect User Stickiness in Social Commerce: A Consumer Engagement Experience Perspective

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Abstract: Social commerce (s-commerce) is a rapidly developing form of e-commerce powered by social media influencers (SMIs). It can create valuable opportunities for retailers. In light of this growing trend, this study explores the influence of consumers' engagement experiences (social support and presence) on community identification and consumers' attachment to SMIs, along with their impact on consumers' stickiness in the s-commerce context. We explore this through social presence and social support theory. The survey data from 411 s-commerce users via an online questionnaire were analyzed empirically with the PLS-SEM approach. The results indicated that presence and social support have significantly positive impacts on consumers' attachment to SMIs and community identification, respectively. This increases users' stickiness in s-commerce. This study enriches our understanding of user stickiness in s-commerce and can assist online vendors in developing marketing strategies and cultivating sustained relationships with their users.

Keywords: s-commerce; user stickiness; consumers' engagement experience; attachment to social media influencers; community identification



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1. Introduction

In recent times, retailers have been cooperating with social media influencers (SMIs) to attract consumers and promote sustainable business development through social media [1]. The evolution of social media is altering both the way people communicate and their lifestyles [2]. People share their opinions, ideas, and experiences on social media to attract their peers. Some of them, commonly known as SMIs, obtain a high level of social attention, attract millions of followers, and even become sources of suggestions for their followers. The emergence of SMIs has caught the attention of retailers and led to a new form of social commerce (s-commerce) [3].

S-commerce, which cultivates SMIs, depends on interpersonal relationships and exerts an interactive social impact on the relationship between users and SMIs as well as on the relationships among users [4]. Social commerce evolved from but is different from traditional electronic commerce. Social commerce is characterized by a consumer-oriented environment highlighting business sustainability, while traditional electronic commerce is focused on a product-oriented environment [5]. Unlike traditional unilateral active e-commerce, s-commerce allows users to create web pages and communities based on common interests [6]. In s-commerce, users share shopping experiences and promote products through bilateral communication and information sharing. Meanwhile, SMIs interact closely with users, sharing their reviews on certain products [7]. S-commerce, based on the social media platforms, integrates the useful features of virtual communities and e-commerce for retailers, forming an information system and a new social structure. S-commerce has become a groundbreaking form of commerce and emerged as a key enabler

in the promotion of sustainable online shopping. Multiple social media platforms provide ample social commerce business opportunities, both offline and online, and contribute to the continuity and sustainability of s-commerce [5,8]. In China, s-commerce sales reached USD 290 billion, and the number of s-commerce users exceeded 500 million in 2019 [9]. It is predicted that s-commerce in China will keep booming [10].

The main reason most retailers cooperate with SMIs and establish user communities in s-commerce is that community identity contributes to promoting their products and services and strengthens their sustainable competitive edge [11]. However, some s-commerce platforms are faced with the problem of user churn [12]. According to CNNIC, 40.4% of respondents who stopped using a s-commerce platform thought that the contents or the other users of the platform were not interesting or attractive enough [13]. Further, 22.6% of the respondents were unsatisfied with the information amount and quality of the platform [13]. To ensure that s-commerce is effective, it is crucial to understand how to avoid user churn and facilitate sustainable usage behavior.

Stickiness, as an essential concern for both sustainable usage and purchase behavior, refers to the ability of a website to attract and retain users through its functional attributes [14]. It changes users' online behaviors by increasing their frequency and duration of use, driving a shift from passive acceptance to active reliance [15], urging users to continue using the site without much regard to the setting or cost of switching. Based on You Li et al. [16], the present study adopted users' visit duration and user retention to represent user stickiness. Previous studies have discussed stickiness to brand communities and mobile apps from the perspective of perceived value, satisfaction, or engagement [4,17–19]. Researchers state that potential customers with high stickiness have a higher conversion rate and become real customers than those with low stickiness, which is essential to keeping a business sustainable. Despite its importance, user stickiness in the context of s-commerce has largely been ignored, and no previous studies have used an integrated theoretical framework to understand the antecedents and mechanisms of stickiness in the s-commerce context.

Community identity and attachment to SMIs are two crucial s-commerce factors [3,11]. Drawing on social identity theory, s-commerce users regard themselves as part of a group or community [20]. As a part of an individual's self-concept, community identity is generated by a sense of belonging to a group combined with the cognition and emotion corresponding to that belonging [21]. On condition that a community contributes to the positive aspects of a person's social identity, the person will remain a member of the community and derive satisfaction from this [22]. By presenting product information, participating in activities, and helping other users with their questions, users consider themselves a part of a group or community and produce a community identity. Research has shown that community identification enhances members' desire to integrate into a virtual community and develop emotional attachments to that community [23]. S-commerce facilitates communication and interaction between SMIs and users, which may trigger a user's attachment to a SMI. This sort of attachment can alter consumer behavior and enhance the relationship between users and s-commerce [24]. Nevertheless, previous research has paid little attention to customer engagement experiences and their interaction with users' attachment to SMIs and community identity.

In our study, consumer engagement components included presence and social support. Presence is the extent to which a person perceives others as "real people" when interacting with them through social media [25]. Social support describes the care and responsiveness a person receives from others in a group [26]. Social support and presence are essential s-commerce factors in that social interaction strengthens the bonds among the user, fostering a community [27]. To fill the gap pointed out above, we explore how customers combine the social support they receive from other users and their perceived presence when interacting with SMIs to develop community identity and attachment to SMIs. Thus, our main research questions are: Do presence and social support influence users' attachment to SMIs and their community identification? How do attachment to SMIs and community identification

affect customers' visit duration in s-commerce? What are the effects of attachment to SMIs and community identification on users' retention in s-commerce? The innovative findings on these issues could provide insights into the behavior of s-commerce users, which would help marketers design more appropriate strategies and improve the sustainable growth of s-commerce in China.

2. Theoretical Background and Hypotheses

2.1. User Stickiness (Visit Duration and User Retention)

In the s-commerce context, stickiness means a user's willingness to visit a platform again, either spending more time on it or visiting more frequently [28]. It indicates the ability of a platform to attract and retain users, which is a crucial factor influencing a retailer's profitability [16]. A platform with higher stickiness is likely to enjoy more traffic and users sharing supportive information, which in turn increases users' intention to engage in the activities of the platform. User stickiness is generally split into two main factor categories, technical and social [29]. Technical factors refer to the quality of the s-commerce website, such as the content, style, infrastructure, and web design [16]. Social factors are associated with user perceptions, such as attitudes toward the site, trust, perceived usefulness, and sense of belonging. Therefore, stickiness is a behavioral and psychological change of preference caused by external cues.

Previous research has studied the role of user stickiness in the online context. Judy [30] found that stickiness significantly impacts consumers' decision to purchase from a website. He also found that a high level of perceived value, trust, and positive attitudes toward the website help generate consumer stickiness. Once user stickiness is established, it promotes transaction intentions. Chiang and Hsiao [31] revealed that sharing behaviors and constant motivation significantly contribute to the generation of YouTube user stickiness. Moreover, emotional experience is also regarded as an essential determinant of stickiness.

2.2. Social Presence Theory

Social presence theory is a crucial theory in communication studies research on technology and society. Short, Williams, and Christie [32] proposed this theory in 1976. In social presence theory, presence means a perception of others' existence in an online or virtual environment, which directly influences the process and outcome of communication with others through the medium. This psychological sense implies a feeling of intimacy or directness in interpersonal interaction that can be generated through this medium of communication [33,34]. Presence may result from users' perceptions of sociability, warmth, personal relatedness, and sensitivity to media [32]. With the advancement of technology, presence cannot be ignored in computer-mediated communication.

Studies in the s-commerce field connecting presence to consumer behavior have yielded some useful findings. Shin et al. [35] considered that presence could be used as an alternative to face-to-face communication. Previous research identified that presence, as a key premise, improves customers' feelings of safety and buying attitudes in virtual shopping centers [36]. Presence can increase the frequency and intimacy of online communication [37] and thereby enhances the richness of information provided and obtained. Herrando et al. [38] showed that presence contributes to higher levels of passion, leading users to be more engaged on s-commerce platforms. Li [39] identified that the social features of s-commerce, such as chat rooms and message boards, make customers feel that a s-commerce platform is a place for them to interact, thereby positively influencing their sense of presence. Presence increases feelings of social contact [40], which in turn encourages customers to trust s-commerce sellers [41] and enjoy the shopping experience more [42], which consequently enhances their purchase intentions [43].

Therefore, we apply social presence theory to explore users' perceptions of SMIs in s-commerce. Presence in this study refers to users' experience of interacting and engaging with SMIs when they are engaged on an online commerce platform integrated with social

media technologies. We propose that social presence is a kind of psychological state generated in the communication between users and SMIs.

2.3. Social Support Theory

Social support theory has been used to explain how social relationships affect an individual's emotions and behavior [44]. Not only does social support bring positive feelings such as understanding and caring from other people, but it also allows people to satisfy their social needs through social interaction with their supporters [45]. Even if such support does not directly help solve an individual's problem, receiving social support gives people a wonderful internal emotional experience. Hence, people are usually more willing to interact and help each other in an environment with high social support.

With the emergence of web 2.0 and social media, social support has become a critical factor in s-commerce [46]. An essential function of s-commerce is that consumers obtain and provide more information through interaction, sharing, and helping other customers solve problems or make more informed purchasing decisions [11]. It has been found that consumers who have received support from others in s-commerce are more likely to be engaged and willing to interact with others through a platform [11]. Social support helps strengthen the ties among members using s-commerce platforms, helping to form social communities [47]. In s-commerce, social support consists of two dimensions: informational support and emotional support. Informational support is the provision of knowledge and/or advice that helps other customers. Emotional support is related to psychosocial support, such as caring, helping, and giving comforting communication in the problem-solving processes [48]. This means consumers can spend less time seeking product-related information from their online friends. On the other hand, consumers are immersed in a warm environment with the emotional support they receive while engaging in s-commerce.

Previous research on s-commerce has focused more on the economic benefits of convenience and utility [49], while interaction and mutuality in customer communities have been ignored outside "visible" profitability [50]. Therefore, we explore the psychological motivations present in s-commerce from the perspective of the deep experiential value of customers' needs.

3. Research Model and Hypothesis

3.1. Building Attachment to SMIs with Presence

Presence reflects the actual psychological state of users when they are engaging in social media [33]. It includes two dimensions, telepresence and social presence [51]. Telepresence refers to the feeling of immersion in a remote environment that customers experience [25]. A stronger sense of telepresence indicates that the customer's experience in the remote environment is close to that of a real environment [52]. Not only does telepresence reduce customers' cognitive load in terms of collecting and dealing with information, it also helps customers obtain emotional satisfaction such as pleasure and other positive emotions. In the s-commerce context, users experience a sense of interaction through the social functions provided by the platform, such as message boards, likes, retweets, and live chat, which create a sense of telepresence for users. Social presence is an important factor in the establishment of affective trust among online consumers [41]. It helps bridge the psychological distance between buyers and SMIs and contributes to a closer relationship [53].

Attachment, a crucial emotional expression, is defined as an individual having a strong emotional dependence for a specific object [16]. Prior studies have shown that an individual's attachment to an object may increase if it satisfies the individual's relatedness [54,55]. Relatedness refers to an individual's need to feel close to others. In s-commerce, the interactions between users and SMIs through the Internet enable individuals to obtain relevant information, others' life experiences, and anecdotes, further allowing them to enjoy the relaxing and comfortable experience. This contributes to relatedness satisfaction, which

leads to attachment to SMIs. Therefore, based on the above discussion, this paper proposes the following hypothesis:

Hypothesis 1 (H1). *Buyers' sense of presence positively affects their attachment to SMIs.*

3.2. Attachment to SMIs and User Stickiness (Visit Duration and User Retention)

Attachment has a lasting and stable effect on one's cognition, emotions, and behavior [28]. Individuals who have developed attachment to an object are more likely to develop stronger emotional commitment and loyalty, tend to invest more energy and time, and can even sacrifice themselves to maintain their attachment [56,57]. When users frequently engage with SMIs, the strong connection resulting from the process makes them strive to maintain that emotional bond.

Increasing the stickiness is an important issue for online business sustainability [58]. Bhattacharjee [59] argued that user stickiness is the critical factor in consumers' continued usage of a platform and that it determines the success of s-commerce companies. The business opportunities brought by s-commerce platforms facilitate its sustainability [5,8]. Bahtar et al. [60] stated that stickiness contributes to sustainability. Therefore, user stickiness (visit duration and user retention) is closely related to the sustainability of s-commerce.

Limayem et al. [61] confirmed that emotions directly influence information system usage behaviors. Karahanna et al. [62] demonstrated that emotional responses such as user satisfaction lead to user stickiness. According to Fredrickson's [63] models of emotions, psychological connection such as attachment stimulate a person's thoughts and actions, driving them to use social platforms creatively. Emotional attachment improves users' knowledge and awareness, facilitates problem-solving, and drives long-term platform usage. As a result, this paper proposes the following hypotheses:

Hypothesis 2 (H2). *Attachment to SMIs positively affects visit duration on s-commerce platforms.*

Hypothesis 3 (H3). *Attachment to SMIs positively affects user retention on s-commerce platforms.*

3.3. Social Support and Community Identification

With the rapid development of interactive s-commerce technology, online communities, similar to traditional face-to-face interactions, have become important platforms for groups to exchange social support [64]. Social support is considered an essential embedded resource that is in an individual's social networks [65]. Social support can provide the resources individuals need to cope with the difficulties in their lives, including advice, emotional needs such as esteem, care, and a sense of belonging [66]. As discussed above under 2.3, social support is formed by informational support and emotional support [67]. These forms of support facilitate user collaboration and knowledge exchange. Previous research confirmed the presence of social support in s-commerce. Social support from peers affects the quality of relationships between users and their intention to engage and consistently use an s-commerce platform [65,68]. Kai et al. [69] identified psychological benefits as an essential motivator of customer engagement behaviors. Some customers may actively participate in s-commerce to gain psychological rewards such as attention, recognition, and a sense of belonging.

Community identification is a psychological phenomenon whereby a community member feels a sense of belonging and aligned identity with the community [56]. Social identity theory suggests that people form their identity after associating with a community and that that identity informs their behavior [57]. Blake [59] argued that social support as a marker of group membership can create community identity. When a user receives emotional support from another community member, they may treat community members like their real friends and voluntarily engender a commitment to the community [61]. Therefore, community identification is direct feedback of a consumer's experience in a particular community. Following the above description, we formulate the following hypothesis:

Hypothesis 4 (H4). *Buyers' sense of social support, including informational and emotional support, positively affects their community identification.*

3.4. Community Identification and User Stickiness (Visit Duration and User Retention)

As social media continues growing, consumers become more connected to the internet, which creates opportunities for the development of community identification on online platforms. Muniz and Thomas [62] argued that community identification is a process of consumer self-categorization, a psychological sense that one belongs to a group. Community identification arises when a group can meet a member's specific needs. Dholakia et al. [63] found that community identity positively affects engagement. Members with high community identification tend to maintain their identity and status within the group. They build and maintain long-term relationships with their community by enhancing their status and prestige through behaviors such as helping other community members [70]. This attachment motivates users to actively participate in their social community. Thus, the following hypotheses are proposed:

Hypothesis 5 (H5). *Community identification positively affects s-commerce visit duration.*

Hypothesis 6 (H6). *Community identification positively affects s-commerce user retention.*

3.5. Attachment to SMIs and Community Identification

The transfer of emotions, where an individual's emotional attitude toward a particular object can be transferred and spread to objects related to it, is a widespread and common phenomenon. For example, an employee's emotional commitment to their colleagues or their supervisor may turn into an emotional commitment to their organization. A number of studies have shown that attachment among members in online communities can act as a mechanism to promote user identification and can increase user attachment toward a community. The closer consumers are to others in the s-commerce community, the more they tend to develop feelings of identification and attachment. Meanwhile, when consumers build and accumulate greater feelings of attachment with other members, their feeling of attachment to their community also grows. Hence, the following hypothesis is proposed:

Hypothesis 7 (H7). *Attachment to SMIs positively affects community identification.*

Given the previous hypotheses, this study built a theoretical model that describes the relationships among customers' engagement experiences (presence and social support), attachment to SMIs, community identification, and user stickiness (visit duration and user retention) (Figure 1).

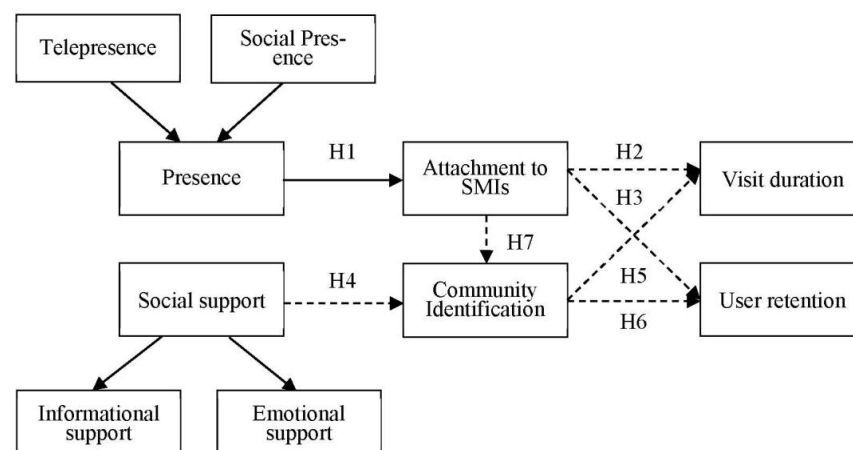


Figure 1. Conceptual model of the concepts used in our hypotheses.

4. Research Methodology

4.1. Measurement Development

To test the conceptual model and all the hypotheses of this study, we quantitatively evaluated Chinese consumers who had shopping experience on Xiaohongshu. We explored this using an online survey website (www.wenjuanxin.com, accessed on 11 July 2022). There are two reasons we selected Xiaohongshu as the most suitable platform for the current study. Firstly, Xiaohongshu has become one of the most influential community-based s-commerce platforms in China. As of July 2019, it had almost 300 million users and over 100 million active monthly users [71]. Secondly, it takes full advantage of its community and provides different levels of relational bonds.

The survey questionnaire consisted of three parts. The first part included three screening questions to determine participants' eligibility for this study. (1) The respondent had to be Chinese; (2) they had to have at least one favorite SMI on Xiaohongshu; and (3) they had to have shopped on Xiaohongshu in the last six months. The second part of the questionnaire was based on respondents' demographics, including age, sex, income, duration of use, frequency of use, and purchase frequency. The third part of the questionnaire consisted of measurement scales involving 36 related items. In this study, to ensure the reliability and validity of the questionnaire, all the items in the scale were adopted from existing studies and modified to fit the s-commerce context. Social support was measured through two dimensions, emotional and informational, adapted from the scale developed by Xi Hu et al. [72]. The presence was defined as a second-order construct including two dimensions, social presence and telepresence. Social presence measures an individual's perception of other individuals and their relationships in the interaction process [73,74]. It describes the psychological distance between an individual and another participant in the interaction [73,75]. Telepresence measures an individual's perception of presence in a certain environment built up by the medium [35]. It reflects the feeling of physical closeness to other remote individuals. Both the dimensions were modified from the instruments proposed by Jun Fan et al. [25], Shun Ye et al. [76], and Yi Li et al. [77], with five items for each dimension. The scale for attachment to SMIs was suggested by Oberecker and Diamantopoulos [78] and You Li et al. [16] and has six items. The items for community identification were developed by Sebastian Molinillo et al. [11] and Mei-Hui Chen et al. [56]. The items for visit duration were adapted from Lu and Lee [79]. User retention was assessed using four items adapted from the scale developed by Chin-Lung Hsu and Judy Chuan-Chuan Lin, Hsi-Peng Lu, and Ming-Ren Lee [18,79].

The instrument items for independent and mediating variables were measured on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), whereas a seven-point Likert scale was applied to each of the dependent variables. As all the participants were Chinese consumers, we employed back-translation procedures with three English native speakers who are also Chinese language experts. We then sent the preliminary version of the questionnaire to 30 respondents to investigate how they understood and interpreted the questions. Based on their feedback, the questionnaire was modified with all the expressions more accurate to ensure that all the respondents would understand the questions in the same way.

4.2. Data Collection

The survey was conducted from March 2022 to July 2022. After removing responses with missing information and extreme outliers, we collected a total of 411 valid questionnaires. Of the respondents, 68.86% were female, and the largest age group was between 26 and 30 years old, accounting for 48.66% of respondents. In terms of income, 27.49% of the respondents claimed they received a monthly income ranging from 8000 to 9999 RMB (USD 1260 to 1575). With respect to duration of use, 48.66% of respondents used the s-commerce platform for 30–60 min per sitting, and 54.26% of respondents used Xiaohongshu several times a day. As for the frequency of making a purchase, most respondents shopped via

the s-commerce platform more than once a week, accounting for 35.77% of respondents. Table 1 illustrates the respondents' characteristics in more detail.

Table 1. Respondents' Demographics (N = 411).

Demographic Characteristic	Items	Frequency	Percentage (%)
Sex	Male	128	31.14
	Female	283	68.86
Age	Under 20	6	1.46
	21–25	42	10.22
	26–30	200	48.66
	31–35	124	30.17
	Over 36	39	9.49
Monthly Income (RMB)	Less than 1000	5	1.22
	1001–2999	16	3.89
	3000–5999	80	19.46
	6000–7999	96	23.36
	8000–9999	113	27.49
	Over 10,000	101	24.58
Duration of Use	Less than 10 min	15	3.65
	10–30 min	140	34.06
	30–60 min	200	48.66
	1–2 h	122	29.68
	Over 2 h	28	6.81
Frequency of Use	Once a day	117	28.47
	Several times a day	223	54.26
	Once a week	5	1.22
	Several times a week	66	16.05
	Once a month or less	0	0
Purchase Frequency	Once a week	68	16.54
	Several times a week	147	35.77
	Once a month	51	12.41
	Several times a month	125	30.41
	Several times a year	20	4.87

4.3. Data Analysis Technique

We employed IBM SPSS (version 26.0, Armonk, NY, USA) to analyze the dataset and used SmartPLS (version 3.3.3, Oststeinbek, Germany) for structural equation modeling (SEM). Compared with covariance-based structural equation modeling (CB-SEM), PLS-SEM is the most recommended method for exploratory research [80]. It can handle nonnormally distributed data and is appropriate for identifying possible relationships among constructs [81]. Further, PLS-SEM works with formative and reflective indicators with few statistical identification issues [82]. Following the guidelines of Hair et al. [81], we assessed the measurement model first and then examined the structural model.

5. Results

5.1. Measurement Model

In this study, the measurement model was assessed through different indices of reliability and convergence validity, such as Cronbach's alpha (α), composite reliability (CR), and average variance extraction (AVE). The Cronbach's alpha and CR for each latent variable were higher than the recommended threshold of 0.7 [83,84], indicating high reliability. AVE ranged from 0.530 to 0.645, which exceeded the criterion of 0.5. All factor loadings were more than the standard 0.6 [81], except the 4 measurement items removed from the analysis, indicating the result's satisfactory convergent validity. Table 2 presents the analysis results.

Table 2. Constructs' reliability and validity.

Latent Constructs	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Social Presence (SP)		0.779	0.850	0.531
SP1	0.741			
SP2	0.743			
SP3	0.709			
SP4	0.752			
SP5	0.695			
Telepresence (TP)		0.829	0.880	0.594
TP1	0.745			
TP2	0.769			
TP3	0.781			
TP4	0.783			
TP5	0.776			
Informational Support (IS)		0.726	0.845	0.645
IS1	0.781			
IS2	0.810			
IS3	0.817			
Emotional Support (ES)		0.743	0.838	0.565
ES1	0.696			
ES2	0.791			
ES3	0.724			
ES4	0.792			
Attachment to SMI (ATS)		0.703	0.817	0.530
ATS1	0.713			
ATS2	0.802			
ATS3	0.749			
ATS4	D			
ATS5	0.638			
ATS6	D			
Community Identification (CID)		0.778	0.857	0.601
CID1	0.733			
CID2	D			
CID3	D			
CID4	0.697			
CID5	0.737			
CID6	0.688			
Visit Duration (VD)		0.709	0.836	0.630
VD1	0.824			
VD2	0.772			
VD3	0.786			
User Retention (UR)		0.754	0.844	0.575
UR1	0.771			
UR2	0.744			
UR3	0.754			
UR4	0.765			

Discriminant validity was measured following the heterotrait–monotrait ratio (HTMT) proposed by Henseler, Ringle, and Sarstedt [85]. Table 3 illustrates that all the HTMT ratios were lower than the criterion of 0.90, indicating that all the constructs were free from any discriminant validity issues.

Table 3. Assessment of discriminant validity using HTMT.

Key Variables	1	2	3	4	5	6	7	8
Attachment to SMI (ATS)								
Community Identification (CID)	0.733							
Emotional Support (ES)	0.755	0.638						
Informational Support (IS)	0.592	0.420	0.686					
Social Presence (SP)	0.845	0.671	0.705	0.579				
Telepresence (TP)	0.752	0.729	0.550	0.405	0.829			
User Retention (UR)	0.708	0.638	0.625	0.535	0.591	0.562		
Visit Duration (VD)	0.613	0.627	0.593	0.437	0.639	0.641	0.883	

Note: HTMT < 0.90 (Gold et al. [86]).

5.2. Higher-Order Construct (HOC)

In this study, presence is conceptualized formatively while social support is conceptualized reflectively. Presence consists of two lower-order dimensions, telepresence and social presence [51]. Social support is also formed by two dimensions, informational and emotional support [61]. According to Lee and Cadogan [87], unless a higher-order construct is unidimensional, its lower-order dimensions should not be measured in a reflective model. Therefore, social support was treated as a reflective–formative type in the assessment of higher-order constructs, using the three-step approach [88,89]. In the first step, redundancy analysis was performed with a single global item to test the convergent validity of each higher-order construct [90]. The results in Table 4 show that the global item measures of presence and social support yielded path coefficients greater than the threshold value of 0.70, indicating the validity of presence and social support [90]. In the second step, multicollinearity was not a problem because the variance inflation factors (VIF) were all below the threshold value of 3.0 [91]. Finally, the outer weights of telepresence, social presence, and emotional support were all significant. Although the outer weight did not support the significance of informational support, the corresponding outer loading greater than 0.5 demonstrated its significant effect on social support [81].

Table 4. Assessment of higher-order construct.

HOC	Sub-Dimension/LOC	CV	Outer VIF	Outer Weight	Outer Loading
Presence	Telepresence	0.850	1.810	0.436 ***	0.874 ***
	Social Presence		1.810	0.654 ***	0.946 ***
Social Support	Informational Support	0.798	1.354	0.188	0.643 ***
	Emotional Support		1.354	0.891 ***	0.987 ***

Note: $p < 0.10$, *** $p < 0.001$; HOC (Higher-Order Construct); LOC (Lower-Order Construct); CV (Convergent Validity); VIF (Variance Inflation Factor).

5.3. Structural Model Analysis

We estimated the structural model to test the hypotheses by path coefficient (β) values, explanatory power (R^2), VIF, predictive relevance (Q^2), and effect size (f^2). Hypothesis tests were performed using PLS-SEM specifically with the bootstrapping technique (5000 subsamples). It was revealed that presence is positively related to attachment to SMIs ($\beta = 0.665$, t -value = 19.177, p -value ≤ 0.001), thus supporting H1. Attachment to SMIs significantly and positively contributes to visit duration ($\beta = 0.263$, t -value = 4.115, p -value ≤ 0.001) and user retention ($\beta = 0.362$, t -value = 6.074, p -value ≤ 0.001), providing empirical support for H2 and H3. Similarly, social support has a significant positive impact on community identification ($\beta = 0.266$, t -value = 4.675, p -value ≤ 0.001), supporting H4. Community identification positively influences visit duration ($\beta = 0.329$, t -value = 5.691, p -value ≤ 0.001) and user retention ($\beta = 0.294$, t -value = 4.976, p -value ≤ 0.001). Thus, H5 and H6 are supported. Furthermore, attachment to SMIs is a significant predictor of community identification ($\beta = 0.396$, t -value = 6.484, p -value ≤ 0.001), which supports H7. Table 5 shows the results of the structural path analysis.

Table 5. Assessment of structural model.

Relationship	Path Coefficient	Standard Deviation	t-Value	R ²	Q ²	VIF	f ²
H1: Presence → Attachment to SMIs	0.665	0.035	19.177 ***			1.00	0.792
H2: Attachment to SMIs → Visit Duration	0.263	0.064	4.115 ***			1.43	0.067
H3: Attachment to SMIs → User Retention	0.362	0.060	6.074 ***			1.43	0.138
H4: Social Support → Community Identification	0.266	0.057	4.675 ***			1.46	0.074
H5: Community Identification → Visit Duration	0.329	0.058	5.691 ***			1.43	0.104
H6: Community Identification → User Retention	0.294	0.059	4.976 ***			1.43	0.091
H7: Attachment to SMIs → Community Identification	0.396	0.061	6.484 ***			1.46	0.164
Attachment to SMI				0.442	0.229		
Community Identification				0.346	0.203		
Visit Duration				0.272	0.162		
User Retention				0.334	0.185		

Note. $p < 0.10$, *** $p < 0.001$. f^2 = effect size of path coefficient; R^2 = coefficient of determinants; Q^2 = predictive relevance/Stone-Geisser Q^2 (blindfolding procedure with omission distance of 7).

Moreover, this study calculated R^2 to explain the percentage of variance in the endogenous variables. The results show that the proposed model explains 44.2% of the variance in attachment to SMIs, 34.6% of the variance in community identification, 33.4% of the variance in user retention, and 27.2% in visit duration. The results of R^2 indicate that the structural model had relatively strong explanatory power. Next, we assessed the predictive relevance of the model using blindfolding procedures. Q^2 values corresponding to the endogenous variables were found to be larger than zero, ranging from 0.162 to 0.229, indicating that the model had good predictive power [81].

In addition, the VIF was examined to judge if there were any multicollinearity issues. All the VIF results were below the recommended critical value of 3.3, illustrating no multicollinearity problems among the items.

Finally, we used the effect size to measure the importance of each path. According to Cohen's guideline [92], $f^2 \geq 0.02$ indicates a small effect size, $f^2 \geq 0.15$ indicates a medium effect size, and $f^2 \geq 0.35$ indicates a large effect size. As shown in Table 5, attachment to SMIs ($f^2 = 0.067$) and community identification ($f^2 = 0.104$) exhibit small effect sizes in generating the R^2 of visit duration. In relation to user retention, attachment to SMIs ($f^2 = 0.138$) and community identification ($f^2 = 0.091$) exhibit small effect sizes. Moreover, in terms of attachment to SMIs and presence ($f^2 = 0.792$) had large effect sizes. Community identification and social support ($f^2 = 0.074$) indicated small effect sizes, and attachment to SMI ($f^2 = 0.164$) indicated a medium effect size.

6. Discussion

Presence and social support, as higher-order constructs, were shown to be appropriate variables to be included in our s-commerce model. Presence positively affected attachment to SMIs in the s-commerce context, which is consistent with previous research [7]. This result indicates that interactions on s-commerce platforms strengthen the psychological connection between consumers and SMIs, subsequently enhancing consumers' attachment to SMIs. Social support, measured as informational and emotional support, was shown to be an antecedent of community identification. When users actively offer information and care for their peers, they may develop community identification.

This study explored the effect of attachment to SMIs and found that it has a positive impact on both community identification and user stickiness (visit duration and user retention) in the s-commerce context, which has rarely been discussed in prior studies. As an important part of a community, a SMI contributes to community identification, visit duration, and user retention if users have an attachment to the SMI.

Few scholars have investigated the role of community identification in the mechanism increasing user stickiness in the s-commerce context. The present study is the first to quantitatively examine how community identification affects visit duration and user retention.

If users form a profound and persisting bond with their community, they tend to visit the platform and stay longer more frequently.

7. Conclusions

Based on social presence theory and social support theory, this study explored the constructs and mechanisms affecting user stickiness with an integrated model in the s-commerce context. This study has three main contributions regarding research on user stickiness in the s-commerce context. Firstly, consumers' engagement experiences, including presence and social support, were introduced to the model to assess their effects on attachment to SMIs and community identification, respectively. Secondly, attachment to SMIs was found to be an imperative variable that had a significantly positive effect on community identification and user stickiness (visit duration and user retention). Thirdly, this is the first study explicating the role of community identification concerning user stickiness in the s-commerce context.

7.1. Theoretical Implications

The current study enriches the existing literature on user stickiness regarding s-commerce. Firstly, as a new type of online commerce, s-commerce with SMIs has not been given adequate attention in prior research. Previous studies have not clarified the possible effects of consumers' engagement experiences (presence and social support) on user stickiness. The research framework of this study started with presence and social support, assessed their effects on attachment to SMIs and community identification, and discussed the impacts on user stickiness arising from the said effects.

Secondly, we applied social support theory from users' perspective and linked it with community identification. Most previous studies were from the perspective of retailers and limited to brand page [21] and online community [64] maintenance. However, this study expands the literature on social support in s-commerce by demonstrating social support's positive influence on community identification, which verifies the process through which social support influences user retention and users' sustained use of a s-commerce platform.

Thirdly, previous studies on sustained use behavior on s-commerce platforms were mainly focused on a limited number of antecedent variables, such as perception, satisfaction, and loyalty [25,29,93], from a one-dimensional perspective. However, this study reveals that user stickiness is often triggered by users' attachment to some aspect of a platform [16]. Additionally, although there has been an abundance of theoretical studies on attachments to individuals, there are very few on the social attachment of s-commerce users. Given differences in culture, habits, and laws, it is important to examine user stickiness from a theoretical perspective to provide useful insights for s-commerce business practices. Thus, we fill a gap in the study of s-commerce by exploring how attachment to SMIs affects user stickiness.

7.2. Managerial Implications

Regarding managerial implication, this study provides marketers with several practical and significant insights into how s-commerce platforms and SMIs can adopt certain appropriate strategies to gain competitive advantages. Given the significant positive effects of presence and social support on user stickiness, platform merchants should encourage SMIs to produce original content and promote interaction among users. For instance, platforms may reward users with credits to motivate them to communicate with other users on the platform. Monetary incentives may also be provided to SMIs for "hot" content that they upload. Users tend to perceive the importance attached to them by SMIs and other users (by their community) through communication and feedback, and more frequently interact with others when they feel they belong, thus leading to a stronger sense of presence and social support, which may enhance sustained use of the platform.

Attachment to SMIs and community identification provide guidance to SMIs and s-commerce platforms. In order to increase the effectiveness of marketing strategies,

platforms should optimize user experience through community maintenance. A warm and cozy s-commerce environment strengthens users' community identification and attachment to SMIs, urging users to visit more frequently and stay longer on the platform, which contributes to the sustainable development of s-commerce.

7.3. Limitations and Future Research

Firstly, all the respondents of the survey in this research were Xiaohongshu users. Although Xiaohongshu is a major s-commerce shopping platform in China, the users of other s-commerce platforms such as Taobao Live may have different characteristics. Increasingly more s-commerce platforms (e.g., Amazon Live) are emerging in different countries and cultures. Future research may explore the factors affecting user stickiness in s-commerce in other platforms or cultures. Secondly, there may have been some other relevant factors that were not explored and could be included in the s-commerce user stickiness research model. As s-commerce is a new type of online commerce, future research may consider additional constructs to investigate the mechanisms affecting user stickiness. Thirdly, the methodology used in this study could be built upon further. A quantitative methodology using a survey design strategy facilitates data collection and analysis, while qualitative studies can identify other relevant factors and formulate inferences of causality [94]. Future studies could investigate the mechanism enhancing s-commerce user stickiness using a quantitative approach with experiments and econometric models being used to explore the causality.

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