

# UNDERSTANDING CONTINUANCE USAGE OF SOCIAL NETWORKING SERVICES: A THEORETICAL MODEL AND EMPIRICAL STUDY OF THE CHINESE CONTEXT

*Completed Research Paper*

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## Abstract

*Social networking services (SNS) provide innovative online platforms for social interactions and communications. In order to understand users' continuance intention of using SNS, we first propose a comprehensive research model based on the expectation-confirmation model (ECM) of IS continuance. Our model examines direct and indirect factors affecting users' continuance intention of SNS usage. We then apply the model in an empirical study, in which we collect and analyze survey data from the users of a major Chinese SNS website. The results of the study reveal different effects of individual motivations such as perceived usefulness and perceived enjoyment on continued usage intention (CUI) in SNS. We also find significant impact of non-individual motivation (i.e., structural embeddedness) on CUI. This research not only extends the IS continuance theory into SNS studies, but also provides IS researchers and SNS practitioners empirical insights into CUI in SNS and its underlying factors in the Chinese context.*

**Keywords:** Social networking service; continued usage intention; expectation-confirmation theory; individual motivation; structural embeddedness

## Introduction

The recent development of information and communication technology (ICT) has enabled innovative platforms over the Internet for social interaction and communication. This Internet development features extensive and explosive participations of individual users in Web 2.0 applications and social networking services in particular. Social networking services (SNS) are different from traditional utilitarian information systems used in organizational and workplace situations (Boyd & Ellison, 2007; Theotokis & Doukidis, 2009). SNS integrate various Web 2.0 concepts and applications such as blogs, virtual communities, online games, and multimedia sharing and publication, in order to facilitate and enhance interactions and communications among users and improve their experience in those online social networks. With enormous potentials of integrating innovative business models within the online platforms,

social networking has become a popular and important online service (Boyd & Ellison, 2007; Hu & Kettinger, 2008; Daniel, Kai & Brocke, 2010).

According to the argument of Metcalfe's law in Web 2.0 (Hendler & Golbeck, 2007), the value of an SNS is determined by the scale of its registered users. Without effective and sustained usage, however, initial registration alone is difficult to bring an SNS website the expected value (Hu & Kettinger, 2008; Theotokis & Doukidis, 2009). Therefore, the scale of active users and their continued activities within an SNS should be more important for the success of the SNS. Furthermore, the long-term viability and prosperity of an SNS depend on its users' continued use of its value-added services rather than the Internet users' initial acceptance of its service. Even though a few studies look into post-adoption issues in general IT/IS adoption (Bhattacharjee 2001; Jasperson, Carter, & Zmud, 2005; Karahanna, Straub, & Chervany, 1999; Kim & Malhotra, 2005; Zhang, Guo, & Chen, 2009; Liao, Palvia, & Chen, 2009), current research on social networking adoption rarely examines users' continuance of usage after their initial acceptance. It is thus the object of this study to further the understanding on social networking adoption from initial acceptance to subsequent continuance of usage.

Realizing a lack of knowledge in the area of continuance of usage, we investigate the motivating antecedents and behavior patterns of SNS users after their initial adoption of the SNS. We first develop a research model of continuance of usage in SNS based on the expectation-confirmation model (ECM) of IS continuance (Bhattacharjee, 2001), and then test the proposed model using quantitative survey method. The results of the study provide empirical evidence and understanding of motivational and perceptual factors in users' continued usage of SNS, particularly in a Chinese context. The study extends the current literature in IS continuance. The paper is organized as follows: The next section presents the literature review on IS continuance; the following section discusses the theoretical foundation and research model constructing; in the fourth section we describe the research design of survey method, data collection in China, and data analysis using the partial least squares (PLS) technique; the fifth section presents the data analysis results; conclusion and future research are given in the final section.

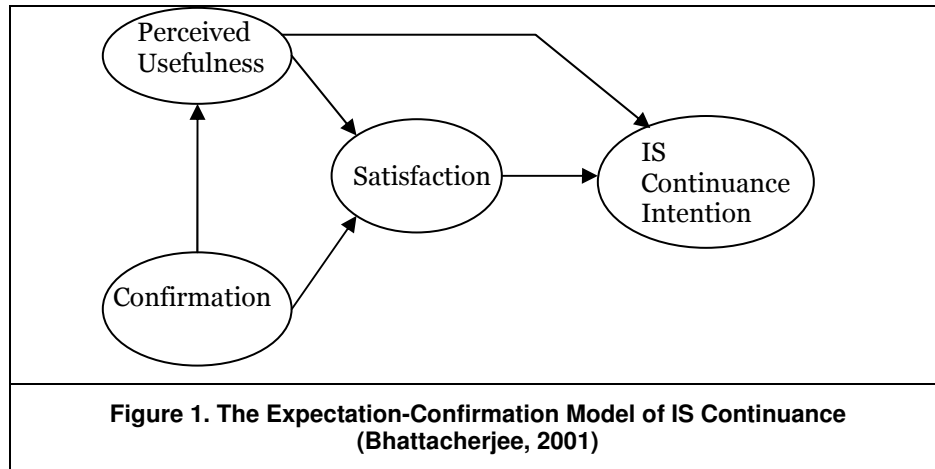
## **THEORETICAL FOUNDATION OF IS CONTINUANCE**

In the past two decades most research in the area of IS (information system) adoption and usage has focused on the early phase of initial acceptance. Technology acceptance model (TAM) and unified theory of acceptance and use of technology (UTAUT), for example, were developed and used to study the antecedents that motivate individuals to adopt a particular IS (see Lee, Kozar, & Larsen, 2003; Venkatesh & Morris, 2003; Zhang et al., 2006). Adoption, however, is just the first step toward the overall success of an IS. Rather than initial acceptance and usage, continued usage is a key determinant of successful IS implementation (Bhattacharjee, 2001; Venkatesh, Speier, & Morris, 2002). A few studies have therefore begun to investigate the concept of IS continuance and its theoretical and empirical differences from IS adoption (Jasperson et al., 2005; Limayem, Hirt, & Cheung, 2007; Liao et al., 2009; Ortiz de Guinea & Markus, 2009). More specifically, current literature examines users' perceptions and behavior at post-adoption or routinization stage of IS implementation, in order to find out the patterns and factors leading to continued use of a particular IS after initial adoption (Bhattacharjee, 2001; Limayem et al., 2007; Jasperson et al., 2005; Karahanna et al., 1999; Liao et al., 2009).

There are two approaches to study IS continuance. One is extending the current theories of IS adoption; that is, testing the confirmed set of antecedents in IS adoption model on continued usage behavior through longitudinal studies (e.g., Karahanna et al., 1999; Venkatesh & Davis, 2000; Venkatesh et al., 2002). In a study to understand the consistency in usage behavior across time, Venkatesh et al. (2002) found that the relationships became insignificant between most determinants in TAM and continued usage when prior usage experience was added as an additional antecedent. The follow-up studies further support that the determinants of initial acceptance were different from the determinants of continued usage and that continued usage of IS was not simply an extension of adoptive behavior (Venkatesh et al., 2002; Venkatesh & Morris, 2003). New theoretical proposition should be developed to answer why users' behavior changes over time during IS implementation.

Therefore, more recent studies on IS continuance take another approach; that is, introducing new theoretical perspectives and adding new factors to construct the research models for IS continuance (e.g., Hong, Thong, & Tam, 2006; Limayem et al., 2007; Ortiz de Guinea & Markus, 2009). One of the first IS continuance models, which was introduced by Bhattacharjee (2001), borrowed the expectation-confirmation theory (ECT) from marketing literature and took into account the distinction of impacting factors between initial acceptance and continuance usage.

The original ECT in marketing posits that consumer satisfaction is a function of prior expectation and post-purchase confirmation/dis-confirmation, and in turn consumer satisfaction is a key determinant of repurchase intention (Venkatesh & Goyal, 2010). Consumer’s prior expectation is defined in the ECT as a set of pre-exposure beliefs about a product. Consumers first develop expectations about the performance characteristics of a product before purchase. Consumers then assess the perceived performance of the product vis-à-vis their original expectations. The cognitive comparison between expectations and actual experiences enables consumers to determine the extent to which their expectations are confirmed. Finally, expectation and confirmation collectively determine a consumer’s level of satisfaction with the product, and in turn influence his/her repurchase intention (Bhattacharjee, 2001; Venkatesh & Goyal, 2010). Grounding on the ECT, Bhattacharjee proposed the expectation-confirmation model of IS continuance (ECM-ISC) and identified the direct and indirect factors affecting continuance intention of IS (see Figure 1).



Unlike TAM, the ECM-ISC focuses on post-adoption behaviors. In order to determine users’ continuance intention of IS, the ECM-ISC introduces two new variables derived from the ECT into the model: confirmation and satisfaction. Confirmation implies the degree of realization of the expected benefits of IS use, and thus positively related to users’ satisfaction with prior IS use (Bhattacharjee, 2001). Satisfaction with IS use will in turn determine users’ continuance intention (Bhattacharjee, 2001). The post-consumption expectation in the original ECT is represented by the third variable of ex post perceived usefulness in the ECM-ISC. The model posits that perceived usefulness is an adequate expectation in the IS continuance context because it is the only cognitive belief which is salient to IS use and can consistently influence user intention across temporal stages of IS use (Bhattacharjee, 2001).

## RESEARCH MODEL AND HYPOTHESES ON SNS CONTINUANCE

The ECM-ISC has been extensively tested in various IS usage studies and confirmed as a strong theoretical underpinning for IS continuance research (see Chou, Min, Chang, & Lin, 2010; Hong et al., 2006; Liao et al., 2009; Limayem et al., 2007; Lin, Sheng, & Tsai, 2005). Meanwhile, social networking has become a major research interest of IS scholars in recent years. Few studies, however, look particularly into the user behavior in SNS. Studies are even scarcer on continued usage in SNS and in the context outside of the United States. Therefore, we propose in this paper a comprehensive continuance usage model of SNS which is based on the ECM-ISC and incorporates knowledge from previous literature on SNS (see Figure 2).

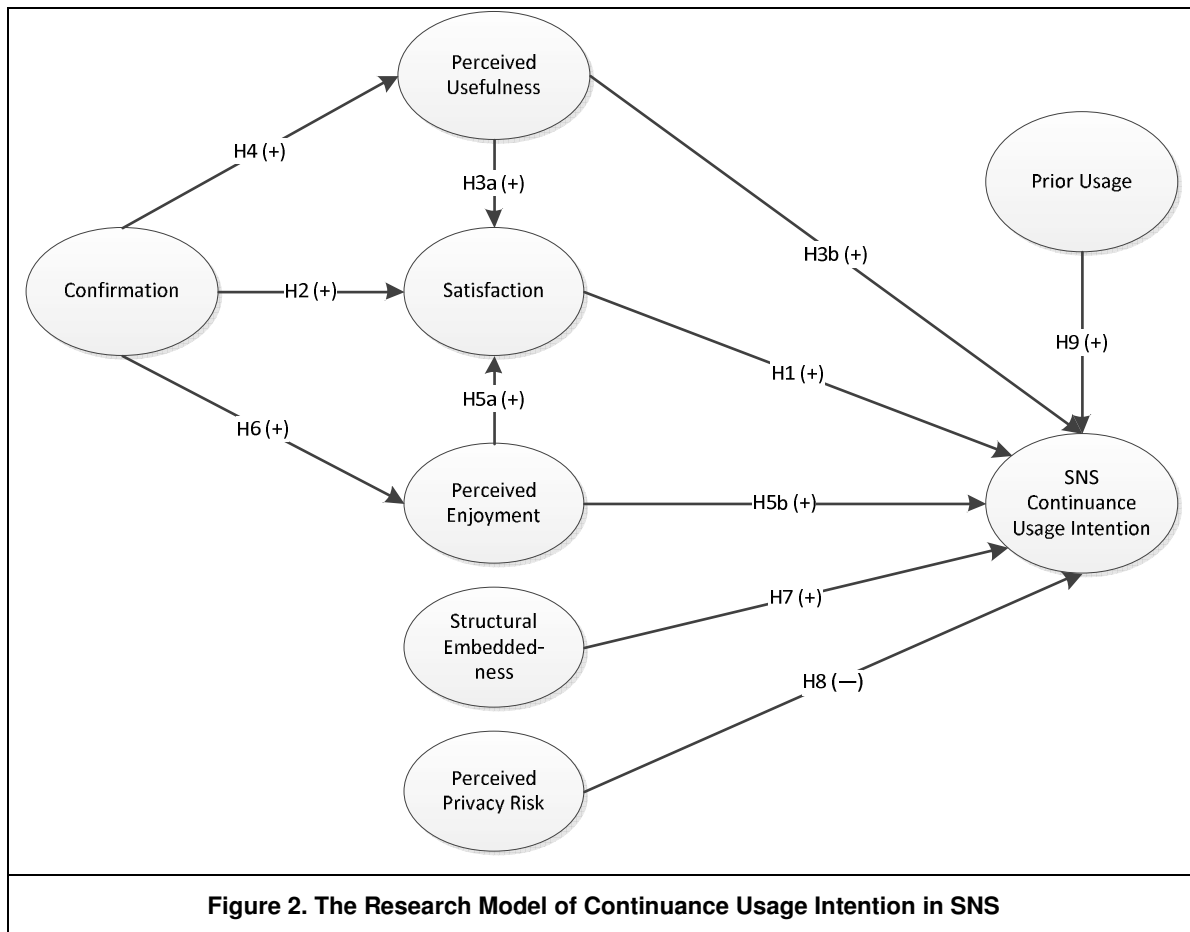


Figure 2. The Research Model of Continuance Usage Intention in SNS

**Hypotheses Derived from the ECM-ISC**

According to the original expectation-confirmation theory in marketing, consumer’s satisfaction refers to his/her cognitive and affective state of fulfillment after a purchase. It is a key determinant of repurchase intention (Oliver, 1980; Kim, 2009). A similar argument can be made in the context of IS continuance where a user’s satisfaction with an IS will reinforce his/her intention to continue using the system (Limayem et al., 2007; Deng, Lu, Wei, & Zhang, 2010). The existing empirical studies based on the ECM-ISC find that the higher user’s satisfaction will lead to the higher level of continuance intention in various online services, such as web portal service, mobile service, virtual community, B2C e-commerce, etc. (see Lin et al., 2005; Thong, Hong, & Tam, 2006; Chou et al., 2010; Kim, 2009; Kang & Lee, 2010) We conceptualize satisfaction in our SNS continuance study as user’s cognitive state representing his/her emotional reaction after using an online SNS. The aforementioned theoretical and empirical knowledge leads us to the first hypothesis on the relationship between satisfaction and SNS continuance usage intention:

**H1:** A user’s degree of satisfaction with using an SNS positively affects his/her intention to continually use the SNS.

The ECM-ISC posits that user satisfaction is determined by two factors: confirmation of expectation after actual use and post-adoption expectation (Bhattacharjee, 2001; Lin et al., 2005; Hong et al., 2006; Venkatesh & Goval, 2010). Expectation before initial usage provides a baseline for users to evaluate their satisfaction (Bhattacharjee, 2001). Users’ confirmation of ex-ante expectations suggests that the users obtained expected value through their usage experiences with the IS and thus leads to a positive effect on users’ satisfaction with their initial IS use (Bhattacharjee, 2001; Kim, 2009). We also examine this positive confirmation-satisfaction relationship in SNS, which is represented in the following hypothesis:

**H2:** A user’s degree of confirmation of his/her ex-ante expectation of an SNS positively affects his/her degree of satisfaction with using the SNS.

Post-adoption expectation is represented by users' ex post perceived usefulness of the IS in the ECM-ISC (Bhattacharjee, 2001). This usefulness captures users' perception of the instrumentality of using the IS for completing their job or working tasks. It thus substantively impacts users' post-adoption attitude towards the IS (Bhattacharjee, 2001). Unlike those utilitarian IS used for improvement of process performance and/or alignment with organizational strategy, most SNS offer virtual platform for individual Internet users to establish their online presences and social networks (Boyd & Ellison, 2007; Hu, 2009; Richter, Riemer, & Vom, 2010). Therefore, in the context of SNS continuance intention, the construct of perceived usefulness drawn from the original TAM and ECM-ISC should be adapted to measure users' perception of the social interaction value realized through using an SNS (Kang & Lee, 2010; Theotokis & Doukidis, 2009; Turel, Serenko, & Bontis, 2010). Because previous empirical studies support the positive association between ex post perceived usefulness and post-adoption satisfaction, we also propose our third hypothesis as follows:

**H3a:** *A user's post-adoption perception on the usefulness of an SNS positively affects his/her degree of satisfaction with using the SNS.*

Perceived usefulness has been consistently found in IT adoption literature as a salient motivator for users' acceptance intention (see Davis, Bagozzi, & Warshaw, 1989; Karahanna, Straub, & Chervany, 1999; Venkatesh & Davis, 2000; Venkatesh et al., 2002). In the ECM-ISC, the ex post perceived usefulness also holds positive influence on users' continuance decisions (Bhattacharjee, 2001; Kang & Lee, 2010; Liao et al., 2009; Lin et al., 2005; Limayem et al., 2007; Thong et al., 2006). In keeping with those findings across both adoption and post-adoption phases in general IS acceptance, we hypothesize that ex post perceived usefulness is also a direct predictor of continuance intention in SNS, in addition to its indirect effect via satisfaction in H3a:

**H3b:** *A user's post-adoption perception on the usefulness of an SNS positively affects his/her intention to continually use the SNS.*

The ECM-ISC argues perceived usefulness could be adjusted by the level of (dis)confirmation resulting from the post-adoption usage experience; that is, confirmation tends to elevate users' perceived usefulness and disconfirmation will reduce such perceptions (Bhattacharjee, 2001; Hong et al., 2006). This confirmation-usefulness relationship was empirically tested and confirmed in the original ECM-ISC (Bhattacharjee, 2001) and we expect it still holds true in SNS continuance contexts: Users' usefulness perceptions on an SNS may be modified as a result of their confirmation experience after using the service in order to be more consistent with reality. This leads to our last hypothesis derived from the ECM-ISC:

**H4:** *A user's degree of confirmation of his/her ex-ante expectation of an SNS positively affects his/her post-adoption perception on the usefulness of the SNS.*

### ***Hypotheses on Perceived Enjoyment as an Additional Intrinsic Motivator in SNS Continuance***

Usage intention or behavior is both intrinsically and extrinsically motivated (Agarwal & Karahanna, 2000; Nov & Ye, 2008; Venkatesh et al., 2002). While perceived usefulness is an extrinsic motivator in the context of utilitarian IS adoption, it becomes an intrinsic motivator in SNS contexts. This is because the use of SNS is mostly out of self-fulfilling: formation and enhancement of interpersonal relationship, relaxation, and emotional expression (Rosen & Kluemper, 2008; Ellison, Steinfield, & Lampe, 2007; Richter et al., 2010). Accordingly, satisfaction is also an intrinsic motivator in using SNS. Beyond these motivators commonly found in the IS adoption literature, perceived enjoyment or playfulness could be added as an additional intrinsic motivator in SNS contexts (Lin et al., 2005; Nov & Ye, 2008; Ortiz de Guinea & Markus, 2009).

For most individual Internet users, using SNS is also for hedonic purposes, which means the degree of self-fulfilling value to the user when using the system (Nov & Ye, 2008; Theotokis & Doukidis, 2009; Turel et al., 2010). The role of hedonic outcome of IS usage has been measured in previous literature through enjoyment or playfulness. Empirical studies have tested and confirmed the factor of perceived enjoyment or playfulness as a significant intrinsic motivator of voluntary IS usage activities (Agarwal & Karahanna, 2000; Ortiz de Guinea & Markus, 2009). Therefore, we also introduce perceived enjoyment into our research model of SNS continuance. Moreover, the research findings in previous studies show that users' higher degree of pleasure and involvement during computer interactions leads to concurrent subjective perception of higher degree of satisfaction. Lin et al. (2005) noted that "higher playfulness results in immediate subjective experiences such as positive mood and satisfaction." Given the

hedonic nature of social networking for individual Internet users, it is plausible that users' perceived enjoyment after using an SNS will influence their satisfaction with the SNS. This leads to the following hypothesis:

**H5a:** *A user's perceived enjoyment of using an SNS positively affects his/her degree of satisfaction with using the SNS.*

In previous SNS studies, Rosen et al. (2008) and Sledgianowski & Kulviwat (2008) argue that it is necessary to add hedonic motivators such as perceived pleasure or enjoyment to better explain the use of SNS. When users perceive more enjoyment during engaging in activities within an SNS, the likelihood that they would revisit the SNS in the future increases (Lin et al., 2005). This leads to the following hypothesis:

**H5b:** *A user's perceived enjoyment of using an SNS positively affects his/her intention to continually use the SNS.*

Previous empirical studies based on the ECM-ISC also verified the confirmation-enjoyment relationship in different contexts of hedonic IS (see Lin et al., 2005; Thong et al., 2006). Therefore we also hypothesize that:

**H6:** *A user's degree of confirmation of his/her ex-ante expectation of an SNS positively affects his/her perceived enjoyment of using the SNS.*

### ***A Hypothesis on Structural Embeddedness as an Extrinsic Motivator in SNS Continuance***

In addition to the intrinsic motivators proposed in the previous hypotheses, we add the structural connections between individuals (i.e., structural capital) as an extrinsic motivator for examining users' actions in our SNS continuance model (Nov & Ye, 2008; Wasko & Faraj, 2005). Previous SNS studies have utilized the social capital theory to interpret user behavior in social networking through users' structural embeddedness in the networks (see Ellison et al., 2007; Richter et al., 2010). According to the social capital theory, structural embeddedness is represented as social interaction ties an individual possesses in his/her social network (Wasko & Faraj, 2005). It has been considered as an important attribute of social capital in various research contexts (Nahapiet & Ghoshal, 1998). Prior studies on virtual community found a significant effect of individuals' structural embeddedness on their knowledge contribution in online professional community of practice (see Wasko & Faraj, 2005; Chiu, Hsu, & Wang, 2006), and a positive relationship between users' structural embeddedness and their photo sharing in online community (Nov & Ye, 2008).

The implication of the social capital theory is even more relevant in social networking research. The aim of SNS is enhancing users' social interaction and communication and thus SNS can help users realize their social values (Boyd & Ellison, 2007). This social value or social capital can be quantitatively reflected by the number of connections that a user has in an SNS-created online community. Therefore, we use a construct of structural embeddedness in our SNS continuance model to measure social interaction ties that a user has built up with his/her friends in an SNS (Chiu et al., 2006). If the user has more interpersonal ties in the SNS, he/she might spend more time interacting with other users and be more willing to maintain those online social relations (or social capital) by continually using the SNS. This leads to the following hypothesis:

**H7:** *A user's extent of structural embeddedness in an SNS positively affects his/her intention to continually use the SNS.*

### ***A Hypothesis on Perceived Privacy Risk as an Extrinsic Inhibitor in SNS Continuance***

Privacy has persistently been a major concern amongst both users and researchers of SNS. Due to the openness and social interactive nature of SNS, personal information of users can be easily collected, disclosed, distributed, and used with or without users' knowledge and permission. Users might therefore perceive a privacy threat that they will potentially lose control over their own personal information (Pavlou, Liang, & Xue, 2007). Prior studies show that as users get more involved in online services they become more concerned with information privacy (Pavlou et al., 2007; Qin, Kim, & Tan, 2009). On the other hand, the gain of enjoyable experience and the formation and maintenance of online interpersonal relationships imply giving away more personal information and thus creating more privacy risks (Dwyer, Hiltz, & Passerini, 2007). As a prior empirical study found a negative relationship between users' perception on privacy risk and their intention to use online services (Pavlou et al., 2007), we also propose a similar hypothesis in our SNS continuance model:

**H8:** A user's perception on privacy risk of using an SNS negatively affects his/her intention to continually use the SNS.

### ***A Hypothesis on Prior Usage as a Moderator in SNS Continuance***

Among the limited empirical studies on the effect of prior usage on IS continuance, Limayem et al. (2007) found that usage history in terms of frequency and comprehensiveness of prior usage plays a moderator role in determining continuance usage behavior. Kim & Malhotra's (2005) longitudinal research showed that past use could be a determinant of future use. An important premise of IS continuance is that users' belief and intention towards an IS change over time as they gain usage experience with the system (Jasperson et al., 2005; Liao et al., 2009). Accordingly, users' prior usage experience might also affect the strength of the relations between aforementioned predictors and SNS continuance in our model.

Based on the existing literature, the prior usage of SNS could be represented in three dimensions: frequency, duration, and comprehensiveness of usage (Limayem et al., 2007; Venkatesh, Brown, Maruping, & Bala, 2008). Frequency refers to a user's number of visits to an SNS within a certain period. Duration represents the amount of clock time spent using a system. Comprehensiveness reflects the user's variety of usage or the number of different functions or features he/she utilizes on the SNS website. If a user has frequently visited an SNS website, spent longer time on the website, and/or made comprehensive use of the SNS, it is more possible that he/she will continue to use the online service in future. This leads to our last hypothesis:

**H9:** A user's extent of prior usage of an SNS positively affects his/her intention to continually use the SNS.

## **RESEARCH METHOD**

### ***Survey and Measurements***

A survey method was used to collect quantitative data on users' perceptions of their usage of an SNS website. A question at the beginning of the survey was used to determine if the respondent was a registered user of the SNS website at the time of the survey. Only those current users of the service and their answers to the survey were included in the latter data analysis.

To ensure content validity, most of the measurement instruments used in the survey were adopted and/or adapted from previous literature to fit our research on the continuance usage intention in SNS (Agarwal & Karahanna, 2000; Bhattacharjee, 2001; Kim, Malhotra, & Narasimhan, 2005; Pavlou et al., 2007). Specifically speaking, prior usage of the SNS was measured by frequency, duration, and comprehensiveness of use, which were adapted from Limayem et al. (2007) and Venkatesh et al. (2008). The items measuring perceived usefulness were modified based on Limayem et al.'s (2007) operationalization to reflect the social interaction value of using SNS. The measurement for structural embeddedness was developed based on the studies of Nov & Ye (2008) and Chiu et al (2006). The final measurement items for each construct after going through validity and reliability tests are listed in Table 1, which could be found in the next section of "Results."

Most items used a 7-point Likert scale ranging from "strongly disagree" to "strongly agree." The degree of satisfaction was measured on 7-point semantic differential scales from "very dissatisfied" to "very satisfied," "very displeased" to "very pleased," "very frustrated" to "very contented," and "absolutely terrible" to "absolutely delighted."

### ***Sampling and Data Collection***

RenRen.com, which is one of the largest SNS website in China, was chosen as the research location to collect data. Taking advantage of the feature of online social networking, we utilized a snowball sampling method to recruit survey participants. Twenty "online friends" of our research team members on RenRen.com were first invited to take the survey. They were then asked to refer other potential respondents either from their online or offline friend lists. The process went on until we received a total of 140 responses. Of those 140 respondents, five never used SNS and thus were eliminated. Among the valid 135 respondents, 44% were males, 56% were females, and more than

70% were below 25 years old. 18% of the respondents had more than ten years of Internet usage experience, 34% exceeded five years, and the rest had at least one year experience with the Internet.

**Data Analysis**

We employed PLS (partial least squares) path modeling, a component-based approach, to conduct data analysis. The exploratory nature of our study and relatively small dataset make PLS appropriate for our analysis (Chin, 1998). We first assessed the measurement model to ensure that the constructs had sufficient psychometric reliability and validity, and then ran the proposed structural model to test the research hypotheses.

**RESULTS**

**Assessment of Measurements**

We used reliability test to check the inter-items consistency of the latent constructs, and confirmatory factor analysis (CFA) to check the item loadings across the constructs (see Table 1). The results show that Cronbach’s alpha of each construct is greater than .5. According to Gefen & Straub (2005), convergent validity is shown when each of the measurement items loads with a significant t-value on its latent construct. All the item loadings in our model are greater than .6 on their expected construct and less than .4 on other constructs. In addition, the t-values for all loadings (based on bootstrap procedure) are significant at .05 level.

Table 1. Reliability Test and Confirmatory Factor Analysis on Measurements			
Latent Constructs	Cronbach's alpha	Measurement Items	Factor Loading
Perceived Usefulness (PU)	0.74	Using SNS makes it easier for me to interact with my friends.	0.85
		Using SNS helps me find new friends.	0.75
		Using SNS websites helps me get useful information from my friends promptly.	0.84
Confirmation of Expectation (CON)	0.86	My experience of using SNS websites is beyond expectation.	0.87
		Using the applications provided by SNS websites brings me more benefits than previously expected.	0.92
		Overall, all my expectations about SNS websites have been satisfied during usage.	0.87
Perceived Privacy Risks (PPR)	0.77	I am concerned that SNS websites are collecting too much personal information.	0.81
		I am concerned about privacy when I'm using SNS websites.	0.64
		I suspect that my privacy is not well protected by SNS websites.	0.84
		I'm worried that unknown third parties will access my personal information on SNS websites.	0.70
Structural Embeddedness (SE)	0.75	Many of my friends (i.e., classmates, colleagues, etc.) use SNS.	0.68
		Many of my friends with whom I communicate frequently use SNS.	0.89
		My friends who use SNS will continue to use them.	0.84



User Satisfaction (SAT)	0.84	How do you feel about your overall experience of SNS? (1)Very dissatisfied/Very satisfied	0.82
		(2)Very displeased/Very pleased	0.87
		(3)Very frustrated/Very contended	0.87
		(4)Absolutely terrible/Absolutely delighted	0.71
Perceived Enjoyment (PEN)	0.85	The actual process of using SNS is pleasant.	0.65
		Using SNS brings me a lot of enjoyment.	0.92
		I enjoy using SNS.	0.92
Prior Usage (PRU)	0.57	On average, how frequently have you used the SNS over the past month? "Visit once or twice a month" to "visit several times each day."	0.66
		On average, how much time do you spend each day using the SNS during the past month? "About 10 mins" to "1 hour or more."	0.69
		What are you primary uses of the SNS? Check all that apply: Blog/Status; Photo/Music; Sharing; Group; Forums; Game; other.	0.84
Continuance Intention to SNS Usage (SCI)	0.85	I intend to continue using SNS.	0.94
		I will continue using SNS to keep in touch with my friends rather than using alternative approaches.	0.93

To further check discriminant validity of the measurement model, we also examined the values of average variance extracted (AVE) of all constructs. All the values of AVEs are greater than the cutoff value .5 (see Table 2). Furthermore, the square root of each factor’s AVE is larger than its corresponding correlation coefficients with other factors, showing good discriminant validity (Gefen & Straub, 2005).

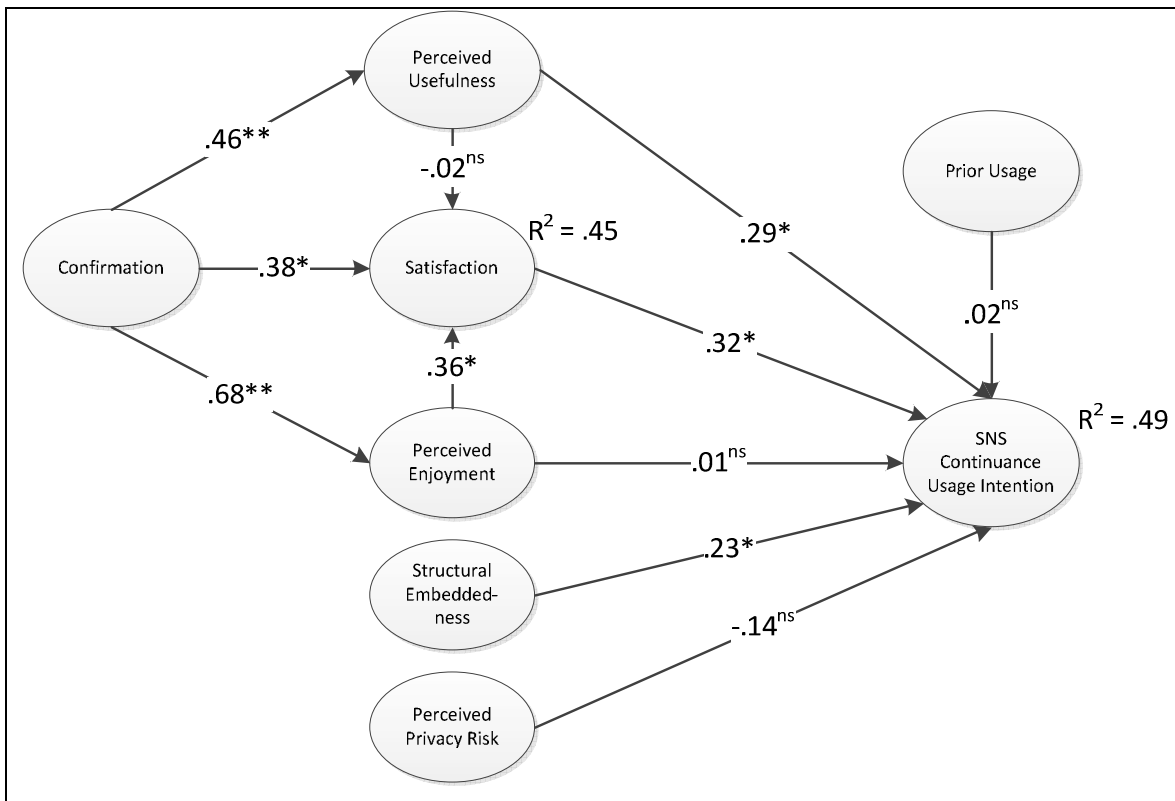
**Table 2. Correlation Matrix and Average Variance Extracted**

	PU	CON	PPR	SE	PEN	SAT	PRU	SCI
PU	0.81							
CON	0.46	0.89						
PPR	-0.08	-0.18	0.75					
SE	0.64	0.43	-0.01	0.81				
PEN	0.57	0.64	-0.32	0.45	0.84			
SAT	0.32	0.53	-0.33	0.21	0.51	0.82		
PRU	0.39	0.33	-0.12	0.34	0.46	0.39	0.73	
SCI	0.56	0.57	-0.28	0.50	0.50	0.44	0.34	0.93

*Note: Diagonal elements are the square roots of AVE*

**Hypotheses Testing**

All hypotheses in the research model were tested simultaneously using the PLS method. Figure 3 shows the final results of the structural model. The R square of the dependent variable (DV) “SNS Continuance Usage Intention” is .49, showing that the model is able to explain a good amount (49%) of variance in the DV. The results also show an acceptable goodness-of-fit between the hypothesized model and the observed data.



**Figure 3. Results of the Structural Model Analysis**

(\* $p < .05$ ; \*\* $p < .01$ ; ns: non-significant)

The results of hypotheses testing based on the final structural model are summarized in Table 3.

Table 3. Hypotheses Testing Results			
Hypotheses	Path	Coefficients (Sig.)	Results
H1	SAT → SCI	.32*	Supported
H2	CON → SAT	.38*	Supported
H3a	PU → SAT	-.02 <sup>ns</sup>	Not supported
H3b	PU → SCI	.29*	Supported
H4	CON → PU	.46**	Supported
H5a	PEN → SAT	.36*	Supported
H5b	PEN → SCI	.01 <sup>ns</sup>	Not supported
H6	CON → PEN	.68**	Supported
H7	SE → SCI	.23*	Supported
H8	PPR → SCI	-.14	Not supported
H9	PRU → SCI	.02 <sup>ns</sup> ;	Not supported

According to Table 3, the most significant impact on continuance usage intention in the model is from users' satisfaction after initial adoption (SAT→SCI: path co-efficient = .32,  $p < .05$ ). The second most significant factor for continuance usage intention is perceived usefulness (PU→SCI: path co-efficient = .29,  $p < .05$ ), and then is structural embeddedness (SE→SCI: path co-efficient = .23,  $p < .05$ ). However, the effects of perceived enjoyment (H5b), perceived privacy risk (H8), and prior usage (H9) on users' continuance usage intention are not found significant in the model.

In addition to those direct effects on continuance usage intention, we also check in the model the indirect effects on the DV through users' satisfaction. While perceived usefulness doesn't contribute to users' satisfaction, both users' post-adoption perception on enjoyment of using the SNS (PEN→SAT: path coefficient = .36,  $p < .05$ ) and users' confirmation on expectation of the SNS (CON→SAT: path coefficient = .38,  $p < .05$ ) have significant impacts on users' satisfaction. Therefore, we can conclude that users' perceived enjoyment and confirmation on expectation indirectly contribute to users' continuance usage intention through the mediation of satisfaction.

## DISCUSSION

This study investigates the direct and indirect factors affecting users' continuance usage intention by conducting a survey on an SNS website in China. The research reveals some interesting findings. First, in our research model users' confirmation on expectation of the SNS and their perception on enjoyment of using the SNS are able to predict users' satisfaction with the SNS. At the same time, users' degree of satisfaction with the SNS and their post-adoption perception on the usefulness of the SNS are the direct predictors of users' continuance usage intention. These findings are consistent with the ones in prior IS continuance studies based on the expectation confirmation theory (see Chou et al., 2010; Lin et al., 2005; Thong et al., 2006).

Second, in our research model users' post-adoption perception on the usefulness of the SNS does not significantly affect users' satisfaction with the SNS. Liao et al.'s (2009) study may reveal the reason. In their study perceived usefulness showed a significant impact on satisfaction of new users (i.e., with less than 6 months experience), but no impact on experienced users.

Third, even though users' perception on enjoyment with the SNS does draw an impact on users' satisfaction, this enjoyment perception does not influence users' continuance usage intention. Thong et al. (2006) also found the relationship between perceived enjoyment and continuance intention was weak in mobile Internet service usage. Chang et al. (2010) found perceived enjoyment showed no relationship with continuance usage intention in massively multiplayer online role-playing games when adding social factors such as social identity and reputation into the model. These findings indicate that the main purpose of using SNS is establishing and enhancing online social interactions, rather than pursuing individual enjoyment. The unique characters of SNS in China could also help explain our findings. Many users of SNS in China were initially attracted by the online games available on the SNS websites. After they joined the SNS websites, however, the users lost their interests over time in playing those games. Instead, they showed more interests on social interactions and emotion sharing, which are the primary functions provided by major SNS websites in China.

Last but not the least, taking into accounts the unique features of SNS, we are able to add new variables and theoretical perspectives into previous IS adoption and continuance models. For instance, we could show that, in addition to the traditional adoption factors of perceived usefulness and perceived enjoyment, structural embeddedness also affects users' continuance usage intention.

## CONCLUSION AND FUTURE RESEARCH

Grounding on the comprehensive literature review on IS continuance, we extend the ECT model to develop a comprehensive continuance usage intention model for SNS research. We then apply and test this model in an empirical study using survey data collected from a major SNS website in China. The findings in our study provide empirical evidence and insights into the relationships among perceived usefulness, confirmation of expectation, perceived enjoyment, structural embeddedness, perceived privacy risks, prior usage, user satisfaction, and continuance usage intention. Those relationships are rarely investigated collectively in previous studies of SNS.

This research also reveals that structural embeddedness, which is a concept differs from individual motivation discussed frequently in previous IS adoption literature, is one of the strong predictors for users' continuance usage intention. The finding implies that users' continuance usage in SNS is also motivated by social benefits provided by SNS.

For future research, we suggest to conduct longitudinal study on a specific group of the users in order to investigate the change of intentions and behaviors over time. This research could also be extended to more diversified user groups which represent different occupations, ages, and income levels in China. It is also desirable to conduct cross-country and cross-culture comparative studies on this topic in the future.

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