

# THE FLIPSIDE OF UBIQUITOUS CONNECTIVITY BY SMARTPHONE-BASED SOCIAL NETWORKING SERVICE (SNS): SOCIAL PRESENCE AND PRIVACY CONCERN

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## Abstract

*The spread of smartphones triggers the universal use of smartphone-based social networking services (SNS) from younger generations in their teens and twenties to older ones in their fifties and sixties. SNS would no longer be the preserve of younger generations. Smartphone-based SNS can be enjoyed by everyone irrespective of age or gender. Under the circumstances, this study attempts to shed light on the sources of enjoyment, which has been argued as a key determinant of hedonic IS use, assuming that ubiquitous connectivity is a foundation of using smartphone-based SNS. This is because the main reason that people use smartphone-based SNS is to maintain seamless connection with others such as family, friends and acquaintances. Furthermore, the study examines factors related to enjoyment considering both sides of ubiquitous connectivity due to smartphone-based SNS use (i.e., social presence and privacy concern) and also verifies the effects of these variables on SNS continuance intention. Our results show that first, ubiquitous connectivity increases social presence and privacy concern. Second, enjoyment comes from not only ubiquitous connectivity but also social presence and privacy concern. Finally, smartphone-based SNS continuance intention is determined by enjoyment, social presence and privacy concern. Discussion and implications on the results are presented.*

*Keywords: Smartphone-based SNS, Ubiquitous Connectivity, Social Presence, Privacy Concern, Enjoyment, Continuance Intention.*

# 1. INTRODUCTION

Along with the rapid spread of smartphones, smartphone-based social networking service (SNS) has also penetrated into our daily lives by enabling people to maintain close and intimate relationships with others as well as to keep in touch with them anytime and anywhere. According to a survey conducted by Korea Internet & Security Agency (KISA 2014a), six-in-ten Internet users are using SNS. It appears that 95 percent of SNS users are using profile-based SNS which refers to the SNS type composed of a main page and sub-pages displaying their personal information such as pictures and interests so that they can share the information with others (e.g., Facebook and KakaoStory). Besides, 94.2 percent of users access SNS by means of smartphones. In this sense, this study uses the term smartphone-based SNS as distinguished from online SNS based on desktop computers. Another annual report demonstrates that the main purpose of using smartphone-based SNS is to communicate with and share their daily lives with family, friends and acquaintances (KISA 2014b). It is also reported that the most popular smartphone-based SNS in Korea is KakaoStory which is connected with KakaoTalk (namely, a free mobile instant messaging (IM) service) (KISA 2014b). Kakao Corporation launched KakaoTalk in 2010 and then released KakaoStory in 2012, recognizing the need of users to share their own personal information along with pictures by using smartphones. KakaoStory allows users to easily upload short messages, photos and video clips to their SNS account. Therefore, it is important to better understand the use of smartphone-based SNS as an important medium for communicating with others and establishing interpersonal relationships.

This study focuses on the intrinsic motivation that people seek to obtain from using smartphone-based SNS which represents a typical hedonic IS consumption pursuing fun and pleasure in the process of using the IS, instead of pursuing utilitarian purposes. In the context of hedonic IS use, previous research has stressed that enjoyment determines users' attitudes and behaviors of the IS (van der Heijden 2004). Many studies have verified that enjoyment is associated with individuals' adoption, use, and continued use of hedonic IS (Barnes 2011; Choi 2012, 2013; Turel et al. 2010, 2011; Venkatesh et al. 2012). Indeed, there is no doubt that enjoyment is a key determinant of user behavior in the context of hedonic IS use. However, little has been known about the sources of enjoyment. For example, Venkatesh et al. (2012) newly included hedonic motivation (i.e., enjoyment) as a determinant of behavioral intention and use behavior, there was no consideration about variables affecting it. Therefore, this study attempts to examine factors leading to enjoyment in the context of smartphone-based SNS.

Considering that smartphone-based SNS is characterized by mobile technologies, this study proposes ubiquitous connectivity as a main source of creating enjoyment. Ubiquitous connectivity through smartphone-based SNS use can meet the needs of people to keep up seamless, constant and synchronized connection with family, friends, and acquaintances, which is the main purpose of using the SNS. It is noteworthy that the mobile characteristic of smartphones allows people to be constantly connected with others around the clock. In this regard, ubiquitous connectivity can be considered as a basic source of enjoyment by satisfying the needs of being together anytime and anywhere.

Furthermore, this study aims to explain both sides of ubiquitous connectivity due to smartphone-based SNS use: social presence and privacy concern. On the positive side, ubiquitous connectivity enhances social presence as if people are together psychologically despite the fact that they are in different places physically. Privacy concern can be viewed as a negative side of ubiquitous connectivity. Ubiquitous connectivity through smartphone-based SNS use involves self-disclosure which is inevitable to what extent for establishing an intimate relationship with others; however, it causes the worry about an invasion of privacy (Animesh et al. 2011; Lowry et al. 2011). For example, when people join KakaoStory, their personal information such as ID, birth date, residence and the latest several pictures are automatically open to others registered on KakaoTalk. Because of privacy concern, SNS providers allow people to adjust the degree of openness of themselves to others. However, some people are sharing many

kinds of personal information through their carelessness. Others may think that it is unavoidable releasing personal information to use smartphone-based SNS. In this sense, this study examines both sides of ubiquitous connectivity simultaneously.

Finally, this study explores factors affecting user intention to continue using smartphone-based SNS. In the context of hedonic IS use, it is verified that enjoyment is a key determinant of continued use of the IS. In addition to enjoyment, this study verifies how social presence and privacy concern are associated with continued use of smartphone-based SNS.

## **2. THEORY AND HYPOTHESES**

### **2.1. Hedonic IS Use: Enjoyment**

Along with the wide spread of smartphones, the use of SNS pervades our everyday life. Irrespective of age or gender, people enjoy doing SNS by smartphones anytime and anywhere. The most popular smartphone-based SNS in Korea is KakaoStory which is connected with KakaoTalk developed by Kakao Corporation, a free short message service (SMS), enabling users to chat with people saved on their smartphone anytime and anywhere. Indeed, KakaoStory has become the national smartphone-based SNS in Korea (KISA 2014b). By using KakaoStory, users can easily share photos and video clips with others, which is reported as a main purpose of using smartphones (KISA 2014b). That is, people use smartphone-based SNS to communicate others and share their daily lives with relatives, friends and acquaintances.

To explain why people adopt, use and further continue to using IS, Davis (1989) suggests technology acceptance model (TAM) in which includes usefulness and ease of use as key determinants of user behavior. Given that TAM reflects the context of using IS for utilitarian purposes (e.g., accomplishing tasks), there is a limitation in explaining the phenomenon of using IS only for fun or pleasure (van der Heijden 2004). In this regard, researchers have started to distinguish hedonic IS use (i.e., referring to intrinsic motivation) from utilitarian IS use (i.e., referring to extrinsic motivation), recognizing that people seek to obtain fun and pleasure in the process of using IS in itself, rather than seeking to accomplish tasks or enhance individual/organizational performance (van der Heijden 2004). It is generally argued that hedonic motivation is an important utility that users aim to obtain from using IS (Nysveen et al. 2005; van der Heijden 2004).

In terms of intrinsic fun and pleasures created in the process of using IS, van der Heijden (2004) conceptualized as 'perceived enjoyment' and asserted that it is the more robust variable in predicting users' IT-related behaviors than usefulness and ease of use in TAM. Subsequently, many researchers have verified that enjoyment is a key determinant of user behavior in the various contexts of hedonic IS use (Choi 2012, 2013; Lee 2011; Nysveen et al. 2005; Turel et al. 2010, 2011; Venkatesh et al. 2012). More specifically, it is proven that enjoyment increases the continued intention to use interactive media services including mobile chatting via mobile devices as well as online chatting via desktop computers (Nysveen et al. 2005). Besides, it is verified that enjoyment is the most influential variable in predicting people's behavioral intention and actual use in the context of a hedonic IS use such as digital artifacts (Turel et al. 2010) and Second Life (Barnes 2011). Venkatesh et al. (2012) additionally included hedonic motivation (i.e., enjoyment) in UTAUT2 (unified theory of acceptance and use of technology) which is the updated version of UTAUT suggested by Venkatesh et al. (2003), reflecting the hedonic facet of IS use. That is, UTAUT is proposed in the context of workplace pursuing higher performance, whereas UTAUT 2 is suggested in the context of mobile internet use pursuing hedonic motivation. Therefore, it can be said that enjoyment is a key factor in determining users' attitudes and behaviors, particularly in the context of hedonic IS use (Turel et al. 2010; van der Heijden 2004). In this sense, this study assumes that enjoyment is a key variable in predicting users' intention to continue to using smartphone-based SNS.

H1. Enjoyment will be positively associated with SNS continuance intention.

## **2.2. Ubiquitous Connectivity**

Given that enjoyment is a key variable in understanding smartphone-based SNS use (i.e., hedonic IS use), the following question is raised: what factors determine user enjoyment? In other words, what are the sources of user enjoyment in using smartphone-based SNS? Previous studies have found several variables influencing enjoyment in various settings of IS use. van der Heijden (2004) put her emphasis on the relationship between enjoyment and two variables of TAM and obtained the result that enjoyment was increased by ease of use while it is not associated with usefulness. From the perspective of a technology addiction, Turel et al. (2011) asserted that online auction addiction along with ease of use increased enjoyment. In the setting of virtual worlds use, Nah et al. (2011, p. 734) revealed that enjoyment was a key antecedent of user attitude and behavioral intention and it was positively affected by a virtual reality (i.e., 3D virtual world environment) and telepresence referring to “the feeling of being a part of the phenomenal environment created by a medium.” Likewise, researchers have suggested antecedents of enjoyment depending on the situation of IS use. In this regard, this study proposes a core determinant of enjoyment in the context of smartphone-based SNS use, considering the unique mobile characteristic namely, ubiquitous connectivity.

Ubiquitous connectivity is considered as a typical mobile characteristic (Kleijnen et al. 2007; Tojib and Tsarenko 2012). Mobile technologies embedded in smartphones enable people to constantly connect with family, friends and acquaintances anytime and anywhere by using smartphone-based SNS. It is argued that the provision of seamless, constant and synchronized connection is the core reason that people use smartphone-based SNS (Lee 2004). Moreover, people use smartphone-based SNS to maintain closer relationships with others as well as to communication with them instantly (Choi 2012, 2013). Therefore, this study postulates that people are likely to obtain fun and pleasure from seamless connection with others via smartphone-based SNS use.

H2. Ubiquitous connectivity increases enjoyment.

## **2.3. Social Presence**

This study considers social presence as a positive aspect of ubiquitous connectivity due to mobile technologies embedded in smartphones. That is, this study proposes that ubiquitous connectivity leads to high levels of social presence, and thereby increasing enjoyment and continued use of smartphone-based SNS.

Social presence is defined as the “degree of salience of the other person in a mediated communication and the consequent salience of their interpersonal interactions (Short et al. 1976 p. 65).” According to this conceptualization, social presence involves not only the evaluation of a communication medium, but also that of interpersonal interactions through using it (Short et al. 1976). In line with this idea, Animesh et al. (2011) conceptualizes social presence as “the perceived sense of how personal, warm, intimate, sociable, or sensitive the social interactions are in the virtual environment” such as Second Life (p. 798). Likewise, the concept of social presence captures how people perceive others in a mediated communication.

Earlier studies of social presence argue that computer-mediated communication (CMC) attenuates the existence of communicators due to its impersonal characteristic and thereby face-to-face communication is the most effective communication method (Short et al. 1976). In other words, people participating in face-to-face communication experience higher social presence than ones participating in CMC. Therefore, media with low levels of social presence is not suitable for interpersonal communication which needs interactivity and reciprocity (Lowry et al. 2010). Media richness theory (MRT) also states that face-to-face communication is the richest communication medium compared to other media such as telephone, written/addressed documents (e.g., memo), and unaddressed documents (e.g., bulletin) particularly, when ambiguity is high (Daft and Lengel 1984, Daft et al. 1987). Media richness is determined by four elements of their capacity, such as instant feedback, the availability of social clues (e.g., physical presence,

tones of voice, and images), the delivery of personalized message (e.g., personal feelings and emotions), and language variety (e.g., natural language and language symbols) (Daft and Lengel 1984; Daft et al. 1987). According to MRT, CMC is regarded as having low levels of media richness. Although social presence and MRT focus on communication media, there is a difference in that the former emphasizes criteria for being rich communication media while the latter highlights social influence in using communication media (Lowry et al. 2010).

However, state-of-the-art technology fills the gap between face-to-face communication and CMC in terms of social presence. Nowadays, people are willing to build and maintain an intimate relationship with others, beyond simply communicating with them, via CMC. Furthermore, the concept of social presence is expanding to capture the phenomenon of establishing a social relationship among others participating in a mediated communication, not limited to explaining the effectiveness of communication media (Animesh et al. 2011; Saunders et al. 2011).

Smartphone-based SNS enables people to perceive high levels of psychological proximity. Smartphone-based SNS can be now regarded as a rich medium by enabling instant feedback due to ubiquitous connectivity, conveying a variety of social clues including texts, images and voice simultaneously, providing services able to express personal feelings and emotions (e.g., emoticon), and supporting language variety. Animesh et al. (2011) stated that participants could create high levels of social presence in virtual environments (i.e., an IT-mediated environment) and verified that social presence was increased by sociability meaning “the extent to which the virtual environment can facilitate the emergence of social space (p. 798).” When a medium provides more social clues promoting interactivity and reciprocity among communicators, social presence is enhanced (Lowry et al. 2010). In this regard, this study postulates that ubiquitous connectivity namely, the provision of seamless, constant, synchronized connection with others registered on SNS leads to higher social presence as if they are together despite being in different places.

Psychological closeness or proximity due to social presence increases flow, which means the intrinsic enjoyment created from engaging in virtual environments (Animesh et al. (2011). When people experience social presence that is, warm and personal interactions with others, they could obtain fun and pleasure through smartphone-based SNS. Given that the main reason of using SNS is to build and maintain a close relationship with others, people who experience social presence in using smartphone-based SNS are more likely to be enjoyable.

In the context of IT use emphasizing the interaction with others, social presence leads to proactive IT use or to the increase of participation in virtual worlds (Animesh et al. 2011). People who establish a warm and personal relationship with others through smartphone-based SNS are more likely to maintain the relationship for longer. Therefore, this study posits the following hypotheses:

H3a. Ubiquitous connectivity increases social presence.

H3b. Social presence increases enjoyment.

H3c. Social presence increases SNS continuance intention.

#### **2.4. Privacy concern**

This study considers privacy concern as the negative side of ubiquitous connectivity. Although ubiquitous connectivity contributes to the increase of social presence, it brings about the issue of privacy concern at the same time. That is, people who are constantly connected with others by smartphone-based SNS tend to have a worry about the disclosure of personal information. As such, privacy concern offsets SNS continuance intention, which is increased by social presence.

IT-mediated communication such as Twitter, Instant Messenger, and SNS allows users to build a personal relationship with others purposely and voluntarily (Lowry et al. 2011). Self-disclosure in IT-mediated communication enables people to promote effective communication and to establish a close relationship while there is an increasing concern about the disclosure of personal information simultaneously, considering the great ripple effect of SNS (Lowry et al. 2011). Owing to such a concern, people prefer to use closed-type SNS which allow a handful of participants, who are only invited to the group, to communicate together on a basis of small groups, such as family, friends, alumni, school clubs and so on (KISA 2014b). People are reluctant to be open about their personal or private information to unknown others. Recognizing this, Kakao Corporation released a new service called KakaoGroup (i.e., closed-type SNS) in addition to KakaoTalk (i.e., an instant messenger service based on smartphones) and KakaoStory (i.e., SNS) in 2014. The new service enables people to enjoy SNS, minimizing the risks due to the leaking of private information and the exposure of privacy (an invasion of privacy) (Kwon 2012). Therefore, privacy concern would be closely associated with users' behavioral intention, actual use, and further continued use of smartphone-based SNS (Lowry et al. 2011).

As people are often required to reveal their profile on SNS, self-disclosure in the use of SNS such as Twitter and Facebook is inevitable to what extent (Lowry et al. 2011). Generally, people determine the extent of communicating personal information with others (Malhotra et al. 2004). Furthermore, people are willing to participate in self-disclosure to establish intimate relationships through SNS. However, people have a tendency to withhold personal information from Web sites when they feel high levels of privacy concerns (Berendt et al. 2005). It is generally argued that privacy concern is negatively related to the attitude of self-disclosure technologies and the use of them (Dinev and Hart 2006; Lowry et al. 2011). In this sense, this study postulates that ubiquitous connectivity due to the use of smartphone-based SNS unavoidably leads to privacy concern and thereby resulting in negative effects to individuals. Therefore, this study proposes the following hypotheses:

H4a. Ubiquitous connectivity increases privacy concern.

H4b. Privacy concern decreases enjoyment

H4c. Privacy concerns decreases SNS continuance intention.

## **2.5 The proposed research model**

The proposed research model is depicted in Figure 1. First of all, the model explains both sides of ubiquitous connectivity due to smartphone-based SNS use: social presence and privacy concern. Self-disclosure by SNS use creates a trade-off between intimacy connection and concerns about releasing personal information (Sherby 2005). That is, people are willing to establish a warm, intimate relationship by disclosing their personal information, which arouses concerns about an invasion of privacy at the same time (Lowry et al. 2011). Second, the model considers enjoyment as a key determinant of user behavior (or intention) and further verifies what factors are associated with enjoyment in the context of smartphone-based SNS. Finally, the model describes the relationship of social presence/privacy concern and SNS continuance intention along with enjoyment.

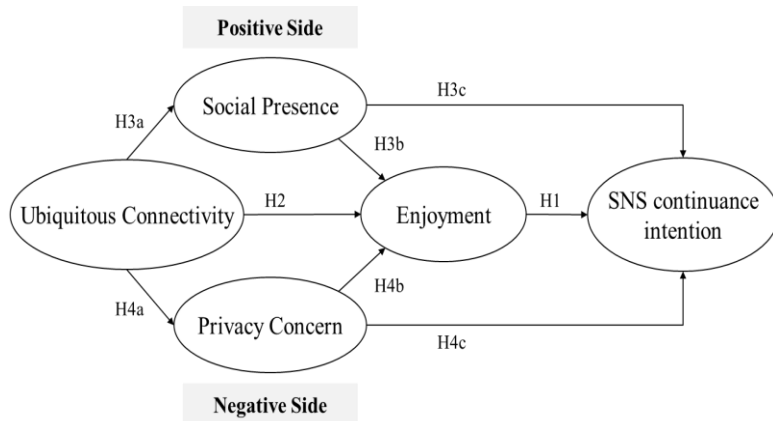


Figure 1. Research model

### 3. METHODS

#### 3.1 Measures

We used instruments developed in previous research, and then modified them slightly to reflect the context of SNS. The items were measured on a seven-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

Ubiquitous connectivity is defined as the extent to which an individual perceives that he or she is linked with others (e.g., relatives, friends, coworkers, and unknown people) by means of smartphone-based SNS anytime and anywhere (Lee et al. 2009; Lee et al. 2012; Tojib and Tsarenko 2012). It is considered as the unique characteristic of mobile technologies (Kleijnen et al. 2007; Tojib and Tsarenko 2012). This study measures ubiquitous connectivity using a three-item scale adopted from Yoon and Choo (2011).

Social presence is defined as the extent to which an individual perceived that he or she establishes a close relationship with others using smartphone-based SNS (Animesh et al. 2011; Short et al. 1976) and is measured using a five-item scale adopted from Animesh et al. (2011).

Privacy concern is defined as the extent to which an individual is anxious about the disclosure of personal information to others on smartphone-based SNS (Lowry et al. 2011) and is measured with three items adopted from Chai et al. (2011-12).

Enjoyment is defined as the extent to which an individual obtains fun by using smartphone-based SNS (van der Heijden 2004) and is measured with three items adopted from Nah et al. (2011).

SNS continuance intention refers to an individual's intention to continue to using smartphone-based SNS (Bhattacharjee 2001) and is measured with three items drawn from Bhattacharjee (2001) and Limayem et al. (2007).

#### 3.2 Data Collection and Sample

To empirically test our research model and hypotheses, we collected data on undergraduate and graduate students at only one university in Korea. We asked students to participate in our online survey during class which is related to MIS subjects using computers. We received a total of 192 responses. After eliminating 3 responses, a total of 189 responses were ultimately utilized for the analysis.

Among the 189 respondents, 98 (51.9 %) were male and 91 (48.1 %) were female. In our sample, 62.4 percentage of the respondents were in their twenties and the rest of the respondents were over the age of

30. Majority of our sample is in their early twenties. Of the main reasons using smart-phones, SNS including KakaoTalk, KakaoStory, and Facebook accounted for 54.5 percentage of the respondents.

Category		Frequency (%)
Gender	Male	98(51.9)
	Female	91(48.1)
Age	Twenties	118(62.4)
	Thirties	53(28.0)
	Forties	15(7.9)
	Over fifties	3(1.6)
Main reasons of using smartphones	Surfing the Internet (e.g., portal sites such as Naver and Daum)	64(33.9)
	Checking emails	8(4.2)
	SNS (e.g., KakaoStory, Facebook, etc.)	103(54.5)
	Playing games	5(2.6)
	Searching regional information using GPS (geographic information system) (e.g., restaurants, gas stations, etc.)	1(0.5)
	Learning/education	0(0.0)
	Mobile commerce (e.g., Mobile banking, Ticketing, etc.)	0(0.0)
	Scheduling	3(1.6)
	Others	5(2.6)

Table 1. Demographics

## 4. RESULTS

### 4.1 Measurement Model Assessment

This study employed the partial least squares (PLS) method with Smart PLS 2.0 to assess the measurement structural models. This method is widely used in IS research for theory testing and can be used to test the relationship between a latent variable and its indicators as well as the structural model. The PLS method imposes minimal constraints on measurement scales, sample sizes, and residual distributions. Therefore, we employed PLS because of this study's small sample size.

Table 2 and Table 3 show the results for the measurement model. From the analysis results in terms of Cronbach's  $\alpha$ , all the constructs used in this study exceeded 0.7, as suggested by Nunnally (1978). This verifies that our constructs have reliability. Moreover, the composite reliability was above 0.8 which exceeds the recommended threshold of 0.7, demonstrating satisfactory reliability. Regarding construct validity, all factor loadings exceeded 0.8 and every item showed the highest loading for its proposed factor, supporting the satisfactory convergent validity. In addition, the values of average variance extracted (AVE) for constructs were above the recommended value of 0.5 (Fornell and Lacker 1981). Therefore, it can be said that measurement items used in this study had high representativeness for the constructs. Concerning discriminant validity, all the items have higher loadings on their corresponding constructs than any cross-loadings on any other constructs. Moreover, as shown in Table 3, the square root of the AVE exceeded all other cross-correlations, thus supporting the discriminant validity.

To confirm the possibility of common method variance (CMV) because we collected data on independent and dependent variables from the same source, we tested Harman's single-factor using an exploratory factor analysis (Podsakoff et al. 2003). The results of EFA showed that five factors were extracted and the variance of the first extracted factor was around 0.20, thus providing evidence that CMV is not an issue for this study.



Constructs	Items	Factor Loadings	AVE	Crobach's <i>a</i>	Composite Reliability
Ubiquitous Connectivity	uc1. I can communicate with others (e.g., family, relatives, friends, etc.) anytime and anywhere by using smartphone-based SNS.	0.767	0.662	0.742	0.854
	uc2. I feel that I am always connected with people around me.	0.900			
	uc3. I can easily communicate with people around me.	0.767			
Social Presence	sp1. When surfing SNS, the interaction with the other users is personal.	0.791	0.737	0.911	0.933
	sp2. When doing SNS, the interaction with the other users is warm.	0.910			
	sp3. When doing SNS, the interaction with the other users is close.	0.892			
	sp4. When doing SNS, the interaction with the other users is humanizing.	0.856			
	sp5. When doing SNS, the interaction with the other users is emotional.	0.839			
Privacy Concern	pc1. When I use smartphone-based SNS, personal privacy is important.	0.899	0.808	0.883	0.927
	pc2. When I use smartphone-based SNS, it usually bothers me when other people ask me personal information.	0.928			
	pc3. When I use smartphone-based SNS, it bothers me to give personal information to so many people.	0.869			
Enjoyment	en1. Smartphone-based SNS is enjoyable.	0.929	0.884	0.956	0.968
	en2. Smartphone-based SNS is not boring.	0.932			
	en3. Smartphone-based SNS is interesting.	0.952			
	en4. Smartphone-based SNS is fun.	0.948			
SNS Continuance Intention	ci1. I intend to continue using smartphone-based SNS rather than discontinue its use.	0.973	0.953	0.975	0.984
	ci2. My intentions are to continue using smartphone-based SNS than use any alternative SNS.	0.984			
	ci3. If possible, I would like to continue my use of smartphone-based SNS.	0.971			

Table 1. Measurement model assessment

Constructs		Mean	SD	A	B	C	D	E
A	Ubiquitous Connectivity	5.21	1.20	<b>0.814</b>				
B	Social Presence	4.38	1.22	0.530	<b>0.859</b>			
C	Privacy Concern	5.84	1.12	0.258	0.040	<b>0.899</b>		
D	Enjoyment	4.85	1.15	0.523	0.540	0.211	<b>0.940</b>	
E	SNS Continuance Intention	5.28	1.24	0.481	0.510	0.290	0.650	<b>0.976</b>

Note. All correlation coefficients were significant at the 0.01 level.  
Values along the diagonal indicate the square root of the AVE.

Table 2. Construct correlation

#### 4.2 Research Model and Hypothesis Testing

To estimate the statistical significance of path coefficients, we employed a bootstrap re-sampling procedure with 1000 subsamples to estimate t-statistics. Figure 2 shows the results for the structural model. Concerning the criteria for assessing the structural model, previous studies have typically

employed  $R^2$  values for endogenous constructs. According to Chin (1998), an  $R^2$  value of 0.15 indicates only weak explanatory power, whereas 0.35 and 0.67 are considered to be moderate and substantial, respectively. Therefore, this study's model showed moderate explanatory power: That is, the  $R^2$  values were 0.281 for social presence, 0.060 for privacy concern, 0.383 for enjoyment and 0.488 for continuance intention. Previous studies have employed Tenenhaus et al.'s (2005) global goodness-of-fit (GoF) criterion as an index for assessing the PLS model globally. The GoF is computed as the geometric mean of average communality and  $R^2$  values. For this study's model, the GoF was 0.305, indicating that the model provided a good fit to the data. Figure 2 provides the path coefficients and the results of our statistical tests, indicating that the other hypotheses except H4b and H4c eight were accepted as statistically significant at the 0.05 level. The rejected two hypotheses were statistically significant but their coefficient value was in the opposite direction from our predictions.

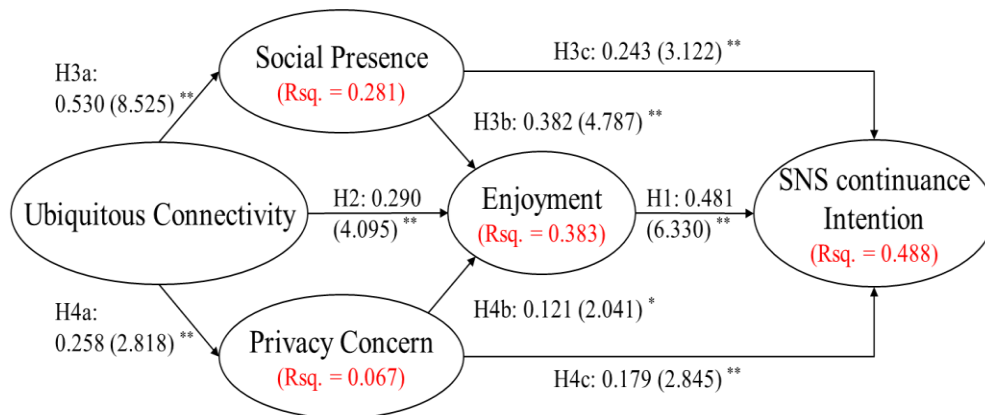


Figure 2. Results for the research model

## 5. CONCLUSIONS AND LIMITATIONS

The spread of smartphones triggers the universal use of mobile SNS from younger generations in their teens and twenties to older ones in their fifties and sixties. SNS would no longer be the preserve of younger generations. Smartphone-based SNS can be enjoyed by everyone irrespective of age or gender. Under the circumstances, this study attempted to shed light on the sources of enjoyment, which has been argued as a key determinant of hedonic IS use, assuming that ubiquitous connectivity is a foundation of using smartphone-based SNS. The main reason that people participate in smartphone-based SNS is to maintain seamless connection with others such as family, relatives, friends, and so on. Furthermore, the study examined the relationship between enjoyment and both sides resulting from ubiquitous connectivity (i.e., social presence and privacy concern) and also examined the effects of these variables on SNS continuance intention. Our results provide empirical evidence on the proposed research model and hypotheses. The details and implications of our results are described as below.

First of all, the results indicate that ubiquitous connectivity due to smartphone-based SNS increases enjoyment. This result implies that people can derive fun and pleasure from communicating with others instantly and constantly and establishing a close relationship with them via smartphone-based SNS. Smartphone-based SNS enables people to maintain constant connection with others such as family, friends, and acquaintances regardless of time and place, which is a core source of causing enjoyment. Although enjoyment has been argued as a key determinant of the adoption, use and continued use of a hedonic IS, there is a lack of understanding on factors leading to it. This study explains that ubiquitous connectivity, which is the main characteristic of mobile technologies, plays a crucial role in causing enjoyment in the context of smartphone-based SNS use.

Furthermore, the results show that ubiquitous connectivity increases not only social presence, but also privacy concern. The finding implies that ubiquitous connectivity due to smartphone-based SNS brings both sides the coin: social presence and privacy concern. The former refers to the positive side of ubiquitous connectivity allowing people to experience psychological closeness or proximity as if they are always together despite being in different places. The latter refers to the negative side of ubiquitous connectivity causing an invasion of privacy. Using KakaoStory (i.e., smartphone-based SNS), people can share their lives with others by uploading text, photos, videos, and status updates on their account. In this process, people inevitably experience the disclosure of personal information to others who they are reluctant to be open. Therefore, it is noteworthy that ubiquitous connectivity contributes to establishing a close relationship with others and it arouses concern about the leaking of private information simultaneously.

Second, the results show that social presence increases enjoyment; however, contrary to our expectation, privacy concern is also positively associated with enjoyment. When people perceive that smartphone-based SNS allows warm, close and personal relationships, they can obtain more fun and pleasure from using it. Given that most people are widely using smartphone-based SNS for strengthening and maintaining their interpersonal relationships, it is the natural that high levels of social presence results in great enjoyment.

With regard to the positive effect of privacy concern on enjoyment, although people should share their personal information with others, it does not decrease enjoyment. Rather, sharing personal information with others by using smartphone-based SNS increases enjoyment. The similar assertion can be found in prior research. Lowry et al. (2011) verified that information privacy concerns increase attitude toward Instant Messaging (IM) technology leading to behavioural intention to use IM and actual use of IM. Our results imply that the purpose of SNS use is to maintain a close relationship, privacy concern is not an issue any more. Despite the worry about invasions of privacy, people seek to more fun and pleasure by sharing their personal information with others in the context of smartphone-based SNS use. Another possible interpretation on this result is that people take the risk of exposure of their privacy to obtain more fun and pleasure from using smartphone-based SNS.

Finally, concerning SNS continuance intention, the results show that it is greatly increased by enjoyment and social presence. The findings provide evidence that enjoyment is the key determinant of continued use in the context of hedonic IS use. Furthermore, when people want to maintain a warm, close relationship with others by using smartphone-based SNS, social presence is also a key predictor of the intention to continue using it. Contrary to our expectation, privacy concern is also positively related to SNS continuance intention. Privacy concern represents that to what extent people participate in self-disclosure. That is, privacy concern results from high levels of self-disclosure. When people are willing to share personal information with others through smartphone-based SNS, they continue to using smartphone-based SNS to maintain intimate relationships in spite of privacy concern. Thus, privacy concern does not hinder one's continued use of smartphone-based SNS.

Overall, this study has a contribution by providing an understanding of continued use of smartphone-based SNS, considering both sides of ubiquitous connectivity which is enabled by mobile technologies embedded in smartphones. Furthermore, this study expands the studies of enjoyment and continued use of IS in the context of hedonic IS use by considering not only ubiquitous connectivity but also social presence and privacy concern. Although many studies put their emphasis on enjoyment, there is a lack of understanding on a key source of enjoyment. This study has a contribution by verifying the impacts of ubiquitous connectivity, social presence and privacy concerns on enjoyment.

In terms of the limitations of this study, first, the majority of the respondents in our sample are twenties and thirties (approximately 90 %). This leads to further research considering the difference between younger people and older people in using smartphone-based SNS. Younger people are more likely to pursue fun and pleasure from using smartphone-based SNS, whereas older people may have more interest

in establishing social relationships from using it. Second, contrary to our expectation, it is proven that despite the worry about privacy concern, user enjoyment and SNS continuance intention are increased. Thus, more studies are needed to understand the role of privacy concern in using smartphone-based SNS.

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