The Social Science Journal 51 (2014) 534–544

Contents lists available at ScienceDirect

The Social Science Journal

journal homepage: www.elsevier.com/locate/soscij

What drives successful social networking services? A comparative analysis of user acceptance of Facebook and Twitter

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ARTICLE INFO

Article history:
Received 10 February 2014
Received in revised form 28 April 2014
Accepted 28 April 2014
Available online 24 May 2014

Keywords:
Social networking services
Technology acceptance model
Twitter
Facebook

ABSTRACT

This study identifies perceived mobility, security, connectedness, system and service quality, usefulness, attitude, and flow experience as key motivational factors for using social networking services (SNSs), and develops a theoretical model that explicates the process in which users adopt Facebook and Twitter by integrating these factors with the technology acceptance model (TAM). While results of structural equation modeling (SEM) on the collected data (N = 2,214) verified the validity and reliability of the research model, Facebook and Twitter users were found to emphasize different motivational factors when deciding to use SNSs. The implications of notable findings and directions for future studies are discussed.

1. Introduction

Social networking services (SNSs) are actively used by individuals who desire social interactions with others via online communities. SNSs have become not only an increasingly important research topic because of their ability to offer more diverse ways of communicating with others compared to traditional communication (Harrison & Gilmore, 2012; Park, Yun, Holody, Yoon, Xie, & Lee, 2013; Sultan, 2014) but, more importantly, an essential part of a billion users' daily lives in the ubiquitous digital environment (Hargittai, 2007). However, research on the psychological factors that motivate SNS use has not been sufficiently conducted, and research on related topics primarily focuses on the technical background of SNSs (Skeels & Grudin, 2009). It is important for developers, engineers, service providers, and marketers to identify key psychological determinants of SNS usage and understand their contribution to shaping user perceptions of—and attitudes toward—SNSs. The goal of this study is, therefore, to develop and validate a user acceptance model that identifies critical motivational determinants of Facebook and Twitter use and integrates them with the technology acceptance model (TAM). Facebook and Twitter are selected because they are conventionally considered the most successful SNSs in the market (Hughes, Rowe, Batey, & Lee, 2012; Lee & Cho, 2011). In doing so, this study addresses the following research questions in an attempt to explicate the process by which users adopt SNSs and explore whether these two popular SNSs have different adoption patterns:

RQ1: Does the proposed research model successfully predict SNS adoption?

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http://dx.doi.org/10.1016/j.soscij.2014.04.005
0362-3319/

RQ2: Do Facebook and Twitter have similar or different adoption patterns?

2. Theoretical background

SNSs are online-based services that typically include web pages of users' profiles and their social circles, and enable establishing and maintaining social relationships with others (Baden, Bender, Spring, Bhattacharjee, & Starin, 2009; Shin, 2010; Sultan, 2014). Most SNSs are believed to have three social functions (Baden et al., 2009; Boyd & Ellison, 2007; Ellison, Steinfield, & Lampe, 2007; Kwak, Lee, Park, & Moon, 2010; Kwon & Wen, 2010). First, they help strengthen existing personal connections both online and offline. Second, they help users establish new social relationships. Third, they offer various useful, advanced services beyond mere exchanges of messages. By utilizing these social functions of SNSs, users can communicate with their friends and share common interests.

Among the numerous SNSs currently available, Facebook and Twitter have emerged as the two most popular, providing interactive and real-time networks of friends (Baresch, Knight, Harp, & Yaschur, 2011; Gusic, 2009; Peterson, 2012). These two SNSs are distinguished by their unique characteristics. Therefore, this study examines Facebook and Twitter, develops a research model that predicts user acceptance of both SNSs, and explores whether users adopt Facebook and Twitter through similar or different patterns.

2.1. Facebook

Since its debut in 2003, Facebook has become the biggest SNS, boasting more than 900 million users (Goldman, 2012). Researchers highlight the following distinguishable features of Facebook (Boyd & Hargittai, 2010; Hoadley, Xu, Lee, & Rosson, 2010; Mendelson & Papacharissi, 2010; Miller & Jensen, 2007; Parris, Abdesslem, & Henderson, 2010; Shin & Shin, 2011; Stone, Zickler, & Darrell, 2008): users can create their own profiles to include personal photographs and information; create or join groups for specific interests and purposes; customize privacy settings in detail; view and track activity histories, changes in their friends' profiles, and comments made by others via News Feed; upload pictures containing locational information; tag their friends in pictures, and send automated notification messages to tagged friends; play social networking games and use various application, such as mobile map services.

These key features affect the daily lives of Facebook users by allowing anywhere-anytime social interactions (Watkins, 2009). Facebook also provides timely updates on social and cultural issues and current trends (Kwak et al., 2010). Furthermore, Facebook has become an increasingly popular and open discussion forum for media, politics, and economics (Johnson & Perlmutter, 2010). As such, politicians and organizations actively use it as a communication tool that effectively conveys their agenda and messages.

2.2. Twitter

Twitter is an online social networking and micro-blogging service. Since its debut in 2006, the SNS has gained more than 500 million users (Koetsier, 2012) who exchange more than 15 billion messages each day (Twitter, 2012). Twitter has the following four notable characteristics: it offers various ways to exchange messages, including SMS, RSS, instant messaging, e-mail, and third-party applications (Wigand, 2010) and limits a message to 140 characters (Manzo, 2009); users do not need approval to *follow* other people and receive their messages (Cha, Haddadi, Benevenuto, & Gummadi, 2010); users can post links to pictures, videos, and music (Angwin, 2009). These characteristics distinguish Twitter as an effective communication, industrial, and marketing tool, especially for mobile-based platforms. For example, a recent poll revealed that more than 80% of users access Twitter on mobile devices, whereas only 20% access it through web browsers on desktop computers (Accenture, 2012).

2.3. Facebook versus Twitter

Although both Facebook and Twitter are designed to promote social interactions, there are clear differences between them. Facebook provides a full array of functions, whereas Twitter is primarily a micro-blogging service with a relatively light, simple interface and simple navigability. That is, Facebook tends to be more versatile and dynamic than Twitter (Davenport, Bergman, Bergman, & Fearrington, 2014; Evans, 2010; Tagtmeier, 2010), allowing users to post various types of multimedia materials such as videos, games, and photos (Mendelson & Papacharissi, 2010; Stone et al., 2008). In contrast, Twitter merely allows posting texts and links to stored photos.

Another difference is that communication via Facebook is more passive than Twitter (Glasson, 2008). Users can communicate with others in a more casual, conversational manner via Twitter, thereby allowing more active communication. For example, Glasson (2008) notes that people are more likely to use Twitter when they wish to invite their friends to an informal gathering, while Facebook is more frequently used to announce a more formal event, such as a wedding reception. In addition, these two SNSs adopt different privacy policies. While content on Twitter is open to the public, Facebook offers complex and customizable privacy measures that allow users to specify what information can be shared and accessed by which users (Debatin, Lovejoy, Horn, & Hughes, 2009).

Therefore, Twitter's simpler user interface, greater openness to the public, and more conversational interaction make it ideal for mobile-based platforms such as smartphones and tablet computers. Conversely, Facebook offers more diverse functions in a full capacity as well as stronger privacy and security measures, making it more suitable for desktop users.

2.4. Technology acceptance model (TAM)

TAM (Fig. 1) explains and predicts user attitudes toward and acceptance of a specific technology or service (Davis,

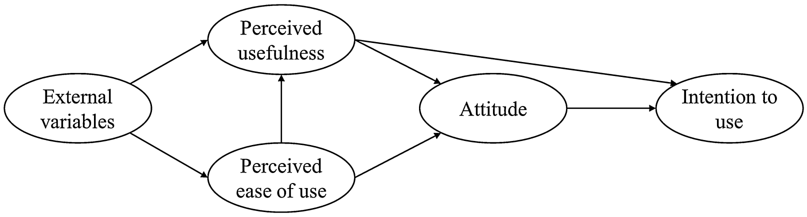

Fig. 1. The original technology acceptance model.

1989). According to TAM, perceived ease of use (PEOU), perceived usefulness (PU), attitude (ATT), and intention to use (IU) are the four psychological factors that largely determine adoption of a technology (Davis, 1989). PEOU and PU are defined as the degree to which individuals believe that using a particular system will improve their job performance and be free of physical and mental efforts, respectively (Davis, 1989). PEOU and PU determine user attitudes toward a certain system or device, and attitudes induced by PEOU and PU then influence user intention to use the system (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). In addition, the IU is the closest factor determining user action. Prior studies have consistently verified the TAM framework's ability to predict user acceptance of novel technologies. More specifically, TAM has been particularly useful in investigating the adoption of Internet-based social media technologies (Kwon & Wen, 2010; Rauniar, Rawski, Yang, & Johnson, 2014; Shin, 2010; Shin & Shin, 2011).

2.5. Hypotheses and research model

The current study conducted a pilot test to identify key motivational factors for SNS use. In-depth interviews were conducted with 15 Facebook users and 15 Twitter users. Participants were asked to freely give their opinions regarding the advantages, disadvantages, and characteristics of Facebook or Twitter, and subsequently assigned to three groups of Facebook users and three groups of Twitter users for group discussions and interviews. At the end of the group session, participants were asked to think about and jot down on a piece of paper the motivational factors that encouraged their use of the SNSs. The papers were used to identify the six most frequently listed factors—namely, perceived mobility, perceived security, perceived system quality, perceived connectedness, perceived usefulness, and flow experience. These six factors were finally selected as the motivational determinants of SNS use examined in this study.

2.6. Attitude (AT)

A large number of previous studies revealed strong correlations between user attitude and behavior. For example, the Theory of Reasoned Action (TRA) demonstrates that a certain individual behavior is critically determined by attitude and intention to perform it (Fishbein, 1979; Madden, Ellen, & Ajzen, 1992; Sheppard, Hartwick, & Warshaw, 1988). With TRA, attitude is defined as an individual's feeling about performing the specific behavior, while attitude is mainly determined by the person's beliefs or evaluations (Davis, 1989; Davis et al., 1989). Individuals' attitudes largely determine their behavioral intentions to use a certain technology or service (Ajzen & Fishbein, 1980). Therefore, TRA framework applied to SNSs leads to the following hypothesis:

H1. A positive attitude will lead to greater intention to use SNSs.

2.7. Perceived usefulness (PU)

TAM indicates that perceived ease of use and perceived usefulness mainly determine user perceptions and attitude toward a technology (Davis, 1989). Perceived usefulness (PU) is originally referred to as the degree to which a user believes that a system or technology improves job performance (Davis, 1989). This study focuses more on the aspects of improving job performance and excludes perceived ease of use in the research model, because several prior studies found that perceived ease of use often weakens the validity of user acceptance models (Cheong & Park, 2005; Park & del Pobil, 2013; Shin & Choo, 2011). In accordance with the TAM framework and related prior studies, this study posits the next two hypotheses:

H2. Perceived usefulness will lead to a more positive attitude toward SNSs.

H3. Perceived usefulness will lead to a greater intention to use SNSs.

2.8. Perceived connectedness (PC)

Individuals enjoy interacting with their friends and sharing information online. SNSs are effective tools for such interactions, which provide opportunities to communicate with others who share similar interests and backgrounds (Shin, 2010; Shin & Kim, 2008). SNSs are available for use 24/7. Therefore, compared to other forms of online communication, SNSs offer a greater sense of connectedness to desired information and groups with similar interests. In this study, perceived connectedness (PC) is defined as the degree to which users feel they are emotionally connected with the world, its resources, and people (Shin, 2010). Users who feel psychologically connected to SNSs may be immersed in a robust degree of mediated presence in the SNS. In addition, Boyd and Ellison (2007) indicate that SNSs enable continued connections between people. Based on this rationale, the current study proposes the following hypotheses:

H4. Perceived connectedness will lead to greater perceived usefulness of SNSs.

H5. Perceived connectedness will lead to a more positive attitude toward SNSs.

2.9. System and service quality (SSQ)

Since Delone and McLean (1992) first introduced the term "System and Service Quality (SSQ)," it been frequently utilized to analyze user experience and usability of a novel system and service (Delone and McLean, 1992, 2003). SSQ is defined as the degree to which users believe that the overall service and system performance meets their expectations. A large number of previous studies revealed a strong association between user perceptions of a technology and SSQ. For example, McFarland and Hamilton (2006) indicate that SSQ has direct positive effects on user intention to use the system. In addition, studies by Lee and Chung (2009) and Liu, Liao, and Pratt (2009) identified SSQ as a critical factor contributing to social media and networking services adoption. Therefore, we hypothesize that:

H6. System and service quality will lead to a more positive attitude toward SNSs.

H7. System and service quality will lead to greater intention to use SNSs.

2.10. Perceived security (PS)

Security is one of the biggest concerns for SNS users, because online-based services are typically subject to potential security threats. Thus, engineering and programming measures that enhance the system's actual reliability have been emphasized. However, users' trust in the system and their intention to use SNSs are not only promoted by technical enhancement of system reliability, but also by users' subjective belief that they can rely on the system to protect their privacy (Linck, Pousttchi, & Wiedemann, 2006). In other words, this study views security as a perceptive variable and defines Perceived Security (PS) as the degree to which users believe that the SNS's security measure is reliable (Yenisey, Ozok, & Salvendy, 2005). Previous studies show that PS leads to more positive feelings toward—and greater perceived control of—a system or service (Kim, 2008). PS is also known to have positive effects on user attitude and perceived usability of the system. Accordingly, we propose the following hypotheses:

H8. Perceived security will lead to greater perceived usefulness of SNSs.

H9. Perceived security will lead to greater system and service quality of SNSs.

H10. Perceived security will lead to a more positive attitude toward SNSs.

2.11. Perceived mobility (PM)

Perceived Mobility (PM) refers to user awareness of the mobility value of a specific system or service (Huang, Lin, & Chuang, 2007; Liang, Huang, Yeh, & Lin, 2007). Mobility allows immediate, easy, and ubiquitous access to online services via wireless networks such as 3G, LTE, and Wi-Fi. Huang, Lin, & Chuang, 2007 and Siau and Shen (2003) indicate that PM positively affects the PU of mobile-based technologies and services. Moreover, PM is found to be associated with general quality and satisfaction with mobile-based information systems (Huang et al., 2007). Given that SNSs are predominantly accessed via mobile devices such as smartphones and tablet computers, findings from prior mobile-based studies are also likely to be observed in this study. Therefore, we propose the following hypotheses:

H11. Perceived mobility will lead to greater perceived usefulness of SNSs.

H12. Perceived mobility will lead to greater system and service quality of SNSs.

2.12. Flow experience (FE)

Flow Experience (FE) is defined as the holistic sensation that people experience when they feel complete involvement in an act (Csikszentmihalyi, 1975, 2000). Koufaris (2002) suggests that FE is one of the most influential determinants of user perceptions of and satisfaction with information systems and online services. When users experience enjoyable interactions with a system, they are more likely to be immersed in it, which then encourages users to reuse the system with a greater sense of presence. Here, the concept of presence refers to the degree to which users feel they are in a mediated system or service apart from their physical location (Nowak & Biocca, 2003; Steuer, 1992). Previous studies suggest that users experience a greater level of FE when they feel a greater sense of presence when using SNSs (Shin & Kim, 2008; Shin & Shin, 2011). Studies also indicate that FE has positive effects on PU and user intention to use information systems and web services (Chang & Wang, 2008). As such, this study posits the following hypothesis:

H13. Flow experience will lead to greater intention to use SNSs.

2.13. Research model

The research model illustrated in Fig. 2 summarizes the potential relationships between the proposed determinants of SNS adoption.

3. Method

3.1. Data collection and analysis

A survey assessing Facebook and Twitter users' PU, ATT, IU, PC, SSQ, PM, PS, and FE was developed and posted on 10 online SNS forums in 8 different nations. In total, 1,063 Facebook users and 1,151 Twitter users completed the survey. To examine the validity of the measurement instrument and proposed research models, confirmatory factor analysis (CFA) and structural equation modeling (SEM) were conducted using LISREL 8.70 statistical software with

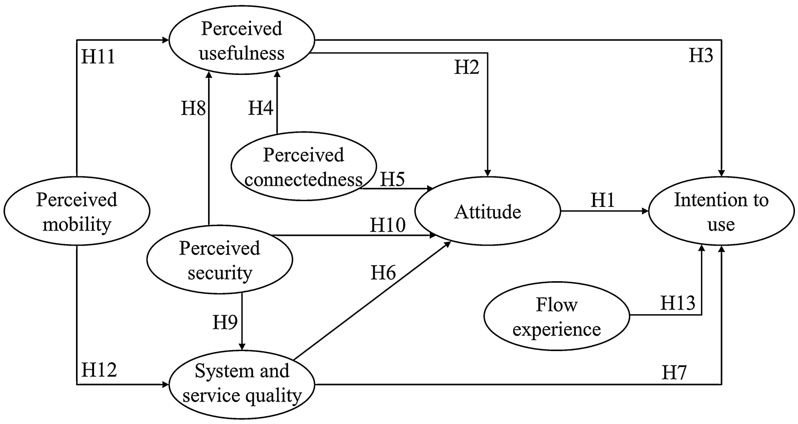

Fig. 2. Proposed research model.

the maximum likelihood method. Given that SEM is known as an effective statistical method for examining large samples (Anderson and Gerbing, 1988; Hair, Black, Babin, & Anderson, 2006), the results of the SEM analysis of our collected data (N = 2,214) are likely to have strong statistical power (Table 1).

3.2. Measurements

Questionnaire items measuring each construct were adopted from previously validated studies. Respondents completed the survey by marking their answers on a 7-point Likert scale ranging from 1 = "strongly disagree" to 7 = "strongly agree." The complete list of questionnaire items and their original sources are reported in Table 2.

4. Results

4.1. Descriptive analysis

The descriptive statistics of all measured variables are reported in Table 3. The survey respondents in this study generally had positive perceptions regarding the use of Facebook and Twitter.

4.2. Measurement and structural models

Results of the confirmatory factor analysis (CFA) and structural equation modeling (SEM) indicated that both the measurement and proposed research models demonstrated strong validity and reliability. As reported in Table 4, the goodness-of-fit index (GFI), adjusted goodness-of-fit (AGFI), normalized fit index (NFI), non-normed fit index (NNFI), comparative fit index (CFI), standardized root mean residual (SRMR), and root mean square error of approximation (RMSEA) of the models were all statistically satisfactory. However, the ratio of chi-square to the degrees of freedom (χ^2/d.f.) of the models was below the recommended level. This can perhaps be attributed to the large sample size of this study, since the validity of the chi-square test is known to decrease when sample size significantly increases (Hair et al., 2006).

In addition, the values for Cronbach's alpha, item-total correlations, composite reliabilities, and factor loadings were all above the recommended value of 0.7, thereby indicating strong internal reliability and convergent validity

Table 1
Sample demographics (N = 2,214).

	Facebook	Twitter
Age		
Under 20	96 (9.0%)	57 (5.0%)
21–30	419 (39.4%)	451 (39.2%)
31–40	313 (29.4%)	293 (25.5%)
41–50	129 (12.1%)	226 (19.6%)
51–60	92 (8.7%)	94 (8.2%)
Over 60	14 (1.3%)	30 (2.6%)
Nationality		
South Korea	192 (18.1%)	221 (19.2%)
USA	155 (14.6%)	149 (12.9%)
United Kingdom	142 (13.4%)	148 (12.9%)
France	137 (12.9%)	162 (14.1%)
Republic of South Africa	111 (10.4%)	94 (8.2%)
Australia	107 (10.1%)	104 (9.0%)
Brazil	96 (9.0%)	125 (10.9%)
India	57 (5.4%)	94 (8.2%)
Others	66 (6.2%)	54 (4.7%)
User experience		
4 weeks–3 months	55 (5.2%)	69 (6.0%)
3 months–6 months	229 (21.5%)	252 (21.9%)
6 months–1 year	226 (21.3%)	199 (17.3%)
1 year–2 years	141 (13.3%)	249 (21.6%)
More than 2 years	412 (38.8%)	382 (33.2%)
Gender		
Male	505 (47.5%)	512 (44.5%)
Female	558 (52.5%)	639 (55.5%)
Education		
No high school	99 (9.3%)	122 (10.6%)
High school	239 (22.5%)	255 (22.2%)
Undergraduate	531 (50.0%)	619 (53.8%)
Graduate	194 (18.3%)	155 (13.5%)
Average time used per day		
0–0.5 h	94 (8.8%)	129 (11.2%)
0.5–1 h	128 (12.0%)	155 (13.5%)
1–2 h	512 (48.2%)	494 (42.9%)
2–4 h	191 (18.0%)	194 (16.9%)
4–6 h	95 (8.9%)	122 (10.6%)
More than 6 h	43 (4.0%)	57 (5.0%)

Source: Author calculations using SPSS.
Notes: Demographic information is entered at the end of the survey.

Table 2
Questionnaire items used in the survey.

Construct	Item
Perceived mobility	PM1: Mobility is one of the most outstanding advantages of Facebook (or Twitter). PM2: It is convenient to use Facebook (or Twitter) anytime-anywhere. PM3: The mobility of Facebook (or Twitter) makes convenient use possible.
Perceived connectedness	PC1: I feel nice when I can access Facebook (or Twitter) at my convenience. PC2: I feel like being connected to the real world because I can see and search for information that I want. PC3: I feel emotionally comforted because I can do something interesting with Facebook (or Twitter) at my convenience.
Perceived security	PS1: I am confident that the private information I provide on Facebook (or Twitter) is secure. PS2: I believe the information I provide on Facebook (or Twitter) will not be manipulated by inappropriate groups. PS3: I believe that the information I provide on Facebook (or Twitter) will not be released without my consent.
Perceived usefulness	PU1: I think Facebook (or Twitter) provides useful service and information to me. PU2: I think Facebook (or Twitter) enhances the effectiveness of my life in general. PU3: I think Facebook (or Twitter) is useful to my life. PU4: I think Facebook (or Twitter) improves my job/task performance.
System and service quality	SSQ1: I have not had any limitations or problems using Facebook (or Twitter) with my devices. SSQ2: Facebook (or Twitter) fully meets my needs and expectations. SSQ3: Facebook (or Twitter) provides precise services that are aligned with the main purpose of the service.
Attitude	ATT1: I think using Facebook (or Twitter) is beneficial to me. ATT2: I think using Facebook (or Twitter) is a nice idea. ATT3: I think Facebook (or Twitter) is helpful to our society.
Flow experience	FE1: I don't feel disturbed when using Facebook (or Twitter). FE2: I feel like I am inside a different world when using Facebook (or Twitter). FE3: I am intensely absorbed in Facebook (or Twitter) when I use the service.
Intention to use	IU1: I will continue to use Facebook (or Twitter). IU2: I will recommend my friends to use Facebook (or Twitter). IU3: I intend to use Facebook (or Twitter) as much as possible.

Source: Huang et al. (2007), Yenisey et al. (2005), Shin and Shin (2011), Davis (1989), Davis et al. (1989), Park and del Pobil (2013), Delone and McLean (1992, 2003), and Nowak and Biocca (2003).
Notes: Final questionnaire items used in the structural equation modeling.

(Table 5). As shown in Table 6, the square roots of the average variance extracted (AVE) of each construct were higher than the correlation values of two constructs in the measurement model, indicating acceptable discriminant validity (Hair, Sarstedt, Ringle, & Mena, 2012; Seyal, Rahman, & Rahim, 2002).

4.3. Hypothesis testing

The results of the hypothesis tests indicate notable differences between Facebook and Twitter adoption. As summarized in Table 7 and Fig. 3, all proposed hypotheses in the Facebook adoption model are confirmed, while H8 in the Twitter model is not supported. Flow experience has the largest effect on intention to use Facebook (H13), while attitude, usefulness, and system and service quality show moderate effects on the intention to use Facebook (H1 and H7). In the Twitter model, flow experience (H13), along with system and service quality, usefulness, and attitude (H7, H3, and H1) has notable positive effects on intention to use. Perceived usefulness, connectedness, system and service quality, and security have positive

Table 3
Mean and standard deviation of constructs.

Constructs	Facebook		Twitter	
	Mean	Standard deviation	Mean	Standard deviation
Perceived mobility*	5.32	1.25	5.82	1.01
Perceived connectedness**	5.60	1.42	5.82	1.21
Perceived security**	5.84	1.39	5.55	1.12
Perceived usefulness	5.70	1.49	5.80	1.03
System and service quality	5.63	1.42	5.59	1.03
Attitude	5.56	1.50	5.59	1.10
Flow experience*	5.48	1.60	5.66	1.20
Intention to use	5.52	1.54	5.60	1.16

Source: Author calculations using SPSS.
* $p < .001$.
** $p < .01$.

Table 4
Fit indices of measurement and structural models.

Fit indices	Measurement model	Structural model (Facebook)	Structural model (Twitter)	Recommended values
χ^2/d.f.	4.69	4.97	4.99	<3.00 (Bentler & Bonett, 1989)
GFI	0.924	0.919	0.934	>0.90 (Seyal et al., 2002)
AGFI	0.919	0.931	0.901	>0.90 (Seyal et al., 2002)
NFI	0.938	0.922	0.941	>0.90 (Bentler & Bonett, 1989)
NNFI	0.949	0.922	0.939	>0.90 (Bentler & Bonett, 1989)
CFI	0.921	0.912	0.933	>0.90 (Bentler & Bonett, 1989)
SRMR	0.050	0.049	0.044	<0.06 (MacCallum, Browne, & Sugawara, 1996; Seyal et al., 2002)
RMSEA	0.049	0.054	0.057	<0.08 (Hair et al., 2006; Jarvenpaa, Tractinsky, & Vitale, 2000)

Source: Author calculations using LISREL 8.70.
Notes: χ^2/d.f., ratio of chi-square to the degrees of freedom; GFI, goodness-of-fit index; AGFI, adjusted goodness-of-fit; NFI, normalized fit index; NNFI, non-normed fit index; CFI, comparative fit index; SRMR, standardized root mean residual; RMSEA, root mean square error of approximation.

effects on attitudes toward Facebook (H2, H5, H6, and H10), with perceived connectedness demonstrating an apparent larger effect size. In contrast, perceived usefulness, connectedness, system and service quality, and security also have positive effects on attitudes toward Twitter, but the magnitudes of the paths are all similar.

The biggest difference between the Facebook and Twitter adoption models is the role of perceived mobility and security. Facebook's usefulness is largely determined by perceived connectedness (H4) and security (H8), while Twitter's usefulness is significantly and moderately affected by perceived mobility (H11) and connectedness (H4), respectively. Facebook's system and service quality is mainly determined by perceived security (H9), while Twitter's system and service quality is evenly influenced by security (H9) and mobility (H12). In addition, the perceived security of Twitter is found to have no significant effects on perceived usefulness (H8).

Perceived usefulness, attitude, flow experience, and system and service quality explain 77.1% of variance in

Table 5
Internal reliability and convergent validity tests.

Construct	Items	Internal reliability		Convergent validity		
		Cronbach's alpha	Item-total correlation	Factor loading	Composite reliability	Average variance extracted
Perceived mobility	PM1	0.82	0.77	0.81	0.85	0.66
	PM2		0.84	0.81		
	PM3		0.79	0.82		
Perceived connectedness	PC1	0.91	0.83	0.77	0.85	0.66
	PC2		0.85	0.83		
	PC3		0.82	0.83		
Perceived security	PS1	0.84	0.81	0.84	0.89	0.72
	PS2		0.81	0.89		
	PS3		0.80	0.82		
Perceived usefulness	PU1	0.95	0.90	0.88	0.91	0.71
	PU2		0.91	0.81		
	PU3		0.88	0.81		
	PU4		0.95	0.87		
System and service quality	SSQ1	0.92	0.84	0.88	0.88	0.71
	SSQ2		0.93	0.81		
	SSQ3		0.89	0.84		
Attitude	ATT1	0.84	0.82	0.77	0.86	0.68
	ATT2		0.73	0.90		
	ATT3		0.84	0.80		
Flow experience	FE1	0.89	0.88	0.82	0.88	0.71
	FE2		0.83	0.84		
	FE3		0.84	0.87		
Intention to use	IU1	0.93	0.88	0.90	0.92	0.80
	IU2		0.88	0.90		
	IU3		0.89	0.89		

Source: Author calculations using SPSS.
Notes: Cronbach's alphas, item-total correlations, composite reliabilities, and factor loadings that are above 0.7 indicate strong internal reliability and convergent validity. Square roots of the average variance extracted of each construct that are higher than the correlation values of two constructs indicate strong discriminant validity.

Table 6
Discriminant validity test with average variance extracted (AVE).

	1	2	3	4	5	6	7	8
Perceived mobility	0.81							
Perceived connectedness	0.44*	0.81						
Perceived security	0.39*	0.41*	0.85					
Perceived usefulness	0.71*	0.55*	0.23*	0.84				
System and service quality	0.52*	0.22*	0.31*	0.33*	0.84			
Attitude	0.19*	0.39*	0.15*	0.41*	0.51*	0.82		
Flow experience	0.56*	0.44*	0.33*	0.42*	0.49*	0.54*	0.84	
Intention to use	0.22*	0.51*	0.41*	0.29*	0.26*	0.39*	0.33*	0.89

Source: Author calculations using SPSS.
* $p<.01$.
The square roots of the AVE are presented diagonally.

Table 7
Summary of hypothesis tests.

Hypothesis	Facebook			Twitter		
	Path coefficient	CR	Supported	Path coefficient	CR	Supported
H1: ATT → IU	0.125**	5.146	Yes	0.053*	2.058	Yes
H2: PU → ATT	0.236**	12.167	Yes	0.266**	10.552	Yes
H3: PU → IU	0.267**	12.774	Yes	0.199**	8.488	Yes
H4: PC → PU	0.570**	25.687	Yes	0.147**	10.674	Yes
H5: PC → ATT	0.493**	27.435	Yes	0.230**	10.170	Yes
H6: SSQ → ATT	0.336**	13.945	Yes	0.301**	10.149	Yes
H7: SSQ → IU	0.172**	9.416	Yes	0.408**	16.199	Yes
H8: PS → PU	0.382**	17.201	Yes	−0.014	−0.983	No
H9: PS → SSQ	0.810**	45.421	Yes	0.541**	25.334	Yes
H10: PS → ATT	0.208**	8.283	Yes	0.242**	8.770	Yes
H11: PM → PU	0.075**	3.370	Yes	0.871**	63.163	Yes
H12: PM → SSQ	0.080**	4.498	Yes	0.428**	20.038	Yes
H13: FE → IU	0.744**	50.601	Yes	0.441**	21.028	Yes

Source: Author calculations using LISREL 8.70.
* $p<.05$
** $p<.001$
ATT, attitude; IU, intention to use; PU, perceived usefulness; PC, perceived connectedness; SSQ, system and service quality; PS, perceived security; PM, perceived mobility; FE, flow experience.

intention to use Facebook, but only 49.4% of variance in intention to use Twitter, suggesting that our research model is generally more effective in predicting Facebook adoption than Twitter adoption. In addition, perceived mobility, connectedness, and security explain 78.1% of variance in the perceived usefulness of Twitter, but only 47.7% of variance in the usefulness of Facebook, This implies that the antecedents of perceived usefulness in the proposed model are more useful in explaining Twitter adoption than Facebook adoption.

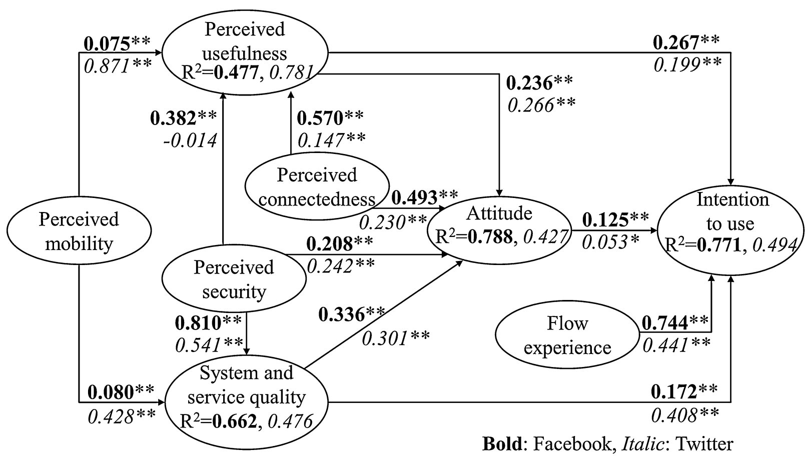

Fig. 3. Proposed research model with standardized path coefficients.

5. Discussion

The goal of this study is to identify motivational factors for SNS use and explore their contribution to determining user acceptance of Facebook and Twitter by developing an integrated research model. Our findings suggest that perceived mobility, usefulness, connectedness, security, and system and service quality play an influential role when deciding to use SNSs. However, evident differences between the two SNSs also emerge, such that intention to use Facebook is largely determined by FE, whereas intention to use Twitter is mainly associated with both FE and SSQ. PC plays a major role in determining user attitudes toward Facebook, while PC, PU, PS, and SSQ evenly contribute to shaping attitudes toward Twitter. In addition, the effects of PS in Facebook adoption are stronger than for Twitter, suggesting that users consider Facebook a more private SNS.

PM emerges as a critical determinant of the PU and SSQ of Twitter compared to that of Facebook. This implies that users view Twitter as more optimized for mobile-based platforms. It is also true that Twitter has targeted the mobile market from the beginning. For example, Twitter restricts the length of each message to 140 characters. In contrast, Facebook started primarily as a web-based service for personal computer users, only adding its mobile service later. Another intriguing implication of this finding is that Twitter's simple, casual user interface may be the critical component of PM that outweighs Facebook's more complex multifunctionality.

In addition, PC plays a different role in the adoption process, such that it has greater effects on PU and ATT in the Facebook model than PU and ATT in the Twitter model. This implies that users are likely to use Facebook to establish and strengthen their social relationships and thereby experience the sense of connectedness. For example, the "Find My Friends" function on Facebook allows users to experience and enhance feelings of connectedness. In contrast, users are likely to use Twitter to share and acquire information, thus emphasizing the informative function of the SNS.

Regardless of these differences, our research model reveals that Facebook and Twitter share several similar characteristics. First, users perceive a moderately high quality of the services provided by both SNSs; the average SSQ scores for Facebook and Twitter are higher than 5 on the 7-point scale. Second, FE is the most influential factor determining intention to use SNSs. This suggests that service providers and interface designers should devote more effort to delivering a greater sense of immersion and telepresence to SNS users.

While our findings add a meaningful contribution to understanding SNS adoption, there are notable limitations of this study that should be considered when designing future studies on related topics. First, individual differences between survey respondents are not factored into the research model. For example, the Unified Theory of Acceptance and Use of Technology (UTAUT) indicates that individual differences such as age, gender, and experience are likely to have moderating effects on the technology adoption process. In particular, Ellison et al. (2007) reveal that individual differences, including gender, ethnicity, year in school, and living on campus affect Facebook usage.

Second, future studies may consider investigating other motivational factors not included in the current study. For example, Shin and Shin (2011) conclude that perceived enjoyment is one crucial determinant of user acceptance of MySpace. Calisir and Calisir (2004) suggest that perceived satisfaction is strongly associated with the PU of enterprise resource planning systems. Given that the proposed research model explains only 77.1% and 49.4% of variance in intention to use Facebook and Twitter respectively, integrating additional factors such as perceived enjoyment and satisfaction may enhance the explanatory power of the research model.

Another limitation is the generalizability of the study's findings. Although our survey was administered globally in eight different nations, SNSs are used worldwide; thus, our findings may not be applicable to nations other than the eight examined in the current study. In addition, respondents might be more self-motivated and engaged than the general population given that they voluntarily participated in the survey, which may restrict the generalizability of our findings. Despite these limitations, the current study adds valuable insights with regard to explaining the process in which users decide to use SNSs and understanding differences between Facebook and Twitter. Future studies on related topics may extend our findings by addressing these limitations.

Acknowledgement

This research was supported by the Ministry of Education, Korea, under the Brain Korea 21 Plus Project (Grant No. 10Z20130000013).

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