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The distinct roles of dedication-based and constraint-based mechanisms in social networking sites

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Abstract

Purpose – The purpose of this paper is to investigate the effects of dedication- and constraint-based mechanisms on users' post-adoption behavior in the social networking site (SNS) context.

Design/methodology/approach – The proposed framework uses user satisfaction and trust belief to capture the dedication-based mechanism and perceived switching costs and social norms to capture the constraint-based mechanism. Hypotheses were tested by applying partial least squares to data from 250 experienced Facebook users. A structural equation modeling was used to test the validity of the proposed research models.

Findings – The analysis results show that SNS users' continuance intention is jointly affected by two distinctive mechanisms: a dedication-based one and a constraint-based one, the former playing a more critical role. The findings indicate that both perceived relative benefits and perceived enjoyment significantly influence user satisfaction. Learning and network size were found to be the key predictors of perceived switching costs.

Research limitations/implications – This study applies the dedication- and constraint-based models by incorporating numerous sets of antecedents. The framework provides a theoretical lens of how two distinctive mechanisms influence SNS users' post-adoption behaviors.

Practical implications – The analysis results provide several insights that can aid SNS providers understand SNS users post-adoption behaviors. Moreover, the findings will help SNS providers effectively facilitate dedication- and constraint-based mechanisms by enhancing the key antecedents of two distinctive mechanisms.

Originality/value – SNSs have become an important component of individuals lives. However, few systematic works investigate the fundamental mechanisms leading to SNS users' continued usage. In an attempt to extend the horizons of SNS research, this study incorporates a set of antecedents to dedication- and constraint-based models.

Keywords User satisfaction, Customer retention, Social networks

Paper type Research paper

1. Introduction

Given the rapid growth in the number of social networking sites (SNSs), such as Facebook, LinkedIn, and Google+, many peoples' lives have been changed in terms of social relations and leisure time. Facebook, one of the most popular SNSs, has become a core activity of online as well as mobile users. The web site has experienced remarkable growth, with more than 1.19 billion active users as of December 2012. A Facebook

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report stated that an average of 728 million users were estimated to log in to Facebook every day and over 800 million users accessed it through mobile devices such as smartphones and smartpads (Yahoo Finance, 2013). According to "Teens, Social Media and Privacy," a report conducted by the Pew Internet & American Life Project (2013), 94 percent of teenager users have a Facebook profile and 81 percent of them actively access it. Moreover, Facebook had 2013 third-quarter revenues of $2.02 billion due to its increasing online and mobile advertising revenue (Washington Post, 2013). Thus, understanding the mechanisms that lead to SNS users' post-adoption behaviors has become very important to both SNS researchers and providers.

In the highly competitive SNS environment, a long-term relationship with users helps SNS providers enhance their profitability and advertising revenue. A research framework is proposed to elucidate the fundamental mechanism behind the formation of SNS users' post-adoption behaviors in the SNS environment. According to social exchange theory, an individual's development of long-term relationships with service providers results from two sets of mechanisms (Bendapudi and Berry, 1997): dedication- and constraint-based ones. In the view of dedication-based mechanism, user satisfaction is widely regarded as a salient predictor of continuance intention (e.g. Bhattacherjee, 2001; Chiou and Droge, 2006; Kim and Son, 2009; Kim *et al.*, 2013). Users with a high level of satisfaction are more likely to exhibit active and intensive use than unsatisfied users. Many empirical studies on SNS have demonstrated that user satisfaction plays an important role in enhancing users' continuance intention (Kang *et al.*, 2013; Kim, 2011; Sun *et al.*, 2014). Trust belief is also identified as a dedication-based factor of users' continuance intention in various service contexts (e.g. Chiou and Droge, 2006; Dwyer *et al.*, 2007; Lin and Liu, 2012). Trust belief is a particularly critical element in the SNS environment due to privacy and security issues (Dwyer *et al.*, 2007; Tan *et al.*, 2012). Indeed, SNS providers can gather and utilize users' private personal data, such as social security number and biographic data, with user permission. Users who trust their SNS provider tend to develop favorable attitudes toward it, which increases their usage levels. Research on SNS post-adoption has revealed the salience of trust belief on users' decision-making processes (Fogel and Nehmad, 2009; Shin, 2010; Sun *et al.*, 2014). Thus, we posit user satisfaction and trust belief as the key elements of the dedication-based mechanism in the SNS environment. Moreover, this study examines the key antecedents of user satisfaction, focussing on the effects of perceived relative benefits, and perceived enjoyment in effectively enhancing user satisfaction.

Contemporary studies highlight the importance of a constraint-based mechanism in developing users' post-adoption behaviors (e.g. Chou and Chiang, 2013; Kim and Gupta, 2012; Kim and Son, 2009; Zhou *et al.*, 2012). A constraint-based mechanism is associated with economic, social, or psychological investments that lock users into the current service (Kim and Son, 2009; Zhou *et al.*, 2012). If an SNS provider can identify key factors that increase user resistance to change, it can create effective strategies to retain its users. The dual model is suggested to examine the impacts of the dedication- and constraint-based mechanisms on user post-adoption behaviors (Kim and Son, 2009). Several studies on IS have shown that the constraint-based mechanism is captured by perceived switching costs (e.g. Kim and Gupta, 2012; Kim and Son, 2009; Zhou *et al.*, 2012). Social pressure from relatives, friends, and colleagues also serves as an important constraint-based mechanism. Thus, this study clarifies the role of perceived switching costs and social norms in shaping SNS users' post-adoption behaviors. Additionally, this study explores key antecedents of perceived switching costs in the SNS environment.

This study contributes to the emerging literature on SNSs in several ways. First, it applies the dedication- and constraint-based models by incorporating numerous sets of antecedents. Our framework provides a theoretical lens of how two distinctive mechanisms influence SNS users' post-adoption behaviors. A structural equation modeling is used to analyze the data of a sample of 250 Facebook users. The analysis results provide several insights that can aid SNS providers understand SNS users post-adoption behaviors. Moreover, these will help SNS providers effectively facilitate dedication- and constraint-based mechanisms by stimulating the key antecedents of two distinctive mechanisms.

The organization of this paper is as follows: Section 2 presents introduces the research model. Section 3 reports the research methodology. In Section 4 presents the empirical results and discusses the findings. Section 5 offers several implications and describes the limitations of this study.

2. Research model and hypotheses

A dual model was suggested to account for the impacts of both the dedication- and constraint-based mechanisms on users' post-adoption behaviors. In particular, service-specific investments, such as learning and network size, play a critical role in users' decision-making processes (Kim and Son, 2009; Ng and Kwahk, 2010; Zhou *et al.*, 2012). This is because this constraint-based mechanism creates a lock-in phenomenon that makes it hard to transfer to an alternative IS. Thus, this study postulates that SNS users' post-adoption behaviors are affected by two distinctive mechanisms: dedication based and constraint based. Figure 1 shows the theoretical model.

2.1 Continuance intention

Cognitive-based behavioral models, such as the theory of reasoned action (Ajzen and Fishbein, 1980), the technology acceptance model (Davis, 1989), and the expectation-confirmation model (ECM) (Bhattacherjee, 2001), have been widely adopted to explain users' continuance behavior in various IS contexts. These cognitive-based models consider behavioral intention a key enabler of facilitating actual behavior. Behavioral intention refers to an individual's motivation, in the sense of the individual's conscious plan, to put effort into carrying out behavior (Eagly and Chaiken, 1993). Many IS studies on post-adoption behavior have demonstrated that actual usage is shaped by continuance intention toward a target IS (e.g. Kang *et al.*, 2013; Kim *et al.*, 2005; Kim, 2012; Wu and Du, 2012). In the SNS environment, users' continuance intention is expected to be positively related to actual usage. We therefore propose the following hypothesis:

H1. Continuance intention has a positive effect on actual usage.

2.2 The dedication-based mechanism

2.2.1 User satisfaction. User satisfaction refers to an *ex post* evaluation based on the user's cumulative experience with a target IS (Spreng *et al.*, 1996). According to the ECM, user satisfaction is regarded as a salient antecedent of continuance intention (Bhattacherjee, 2001). A great many studies on IS and marketing have highlighted that user satisfaction can capture discrepancies between actual functions and expected performance (Bhattacherjee, 2001; Oliver, 1993; Zhou *et al.*, 2012); for example, users are satisfied with an IS when its performance meets or exceeds initial expectations.

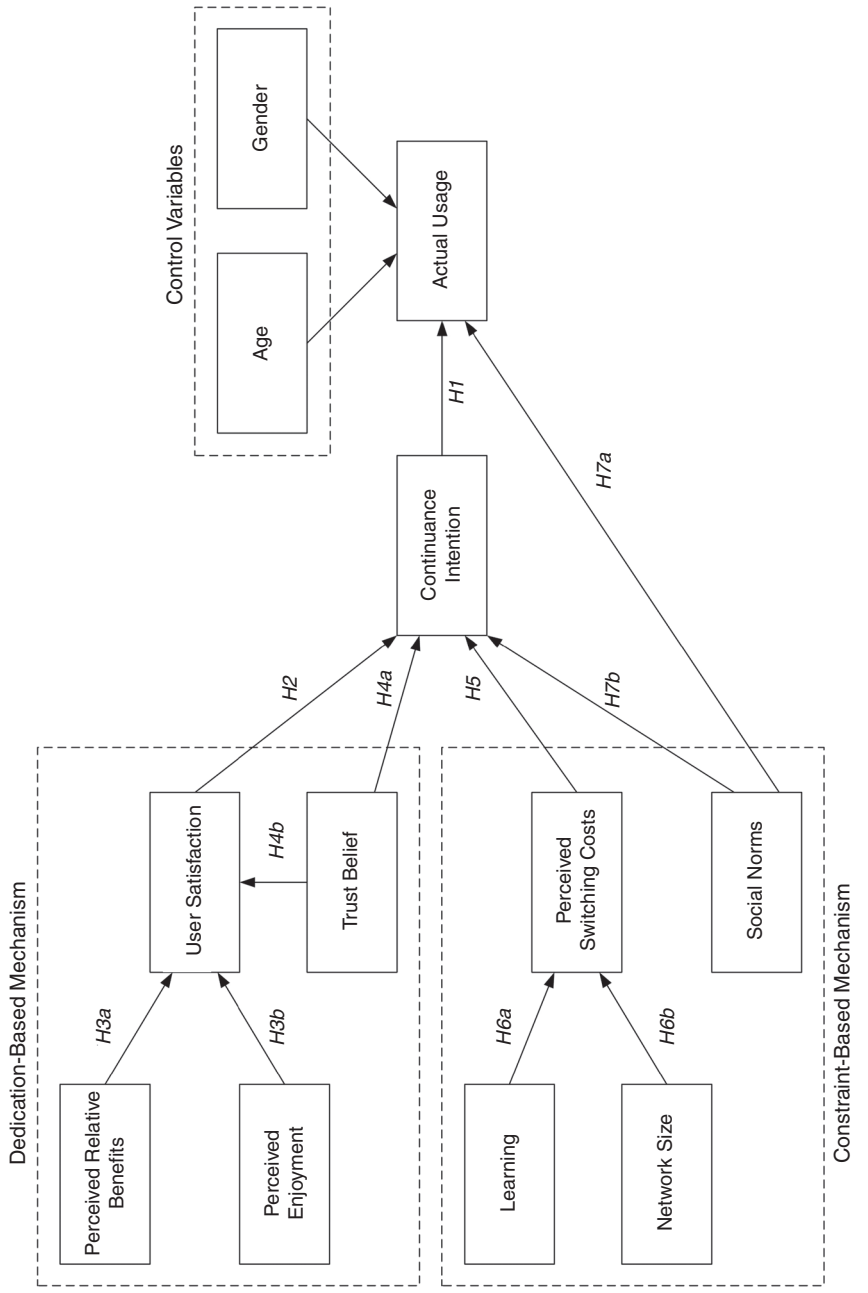

Figure 1.
Research model

Thus, user satisfaction is regarded as an affective response based on direct experience (Bhattacherjee, 2001; Zhou *et al.*, 2012). Satisfied users are more likely to be dedicated to a relationship with a particular IS than unsatisfied users are. Several SNS studies have shown the explorative power of user satisfaction in improving users' level of continuance intention (Kang *et al.*, 2013; Kim, 2011; Sun *et al.*, 2014). In the SNS environment, user satisfaction plays an important role in facilitating the continuance intention of SNS users. Thus, user satisfaction is expected to be a key determinant of users' continuance intention with an SNS:

H2. User satisfaction has a positive effect on continuance intention.

2.2.2 Antecedents of user satisfaction. Perceived relative benefits are the degree to which a service is perceived to be better than other similar services (Rogers, 1995). Users are likely to compare available services and choose the one with better value. Prior studies point out that perceived relative benefits are similar to perceived usefulness, which reflects the performance improvement from using a certain IS (Kim *et al.*, 2009; Lu *et al.*, 2011). However, perceived relative benefits are a more suitable term to capture the relative improvement of a new service in comparison with services (Lu *et al.*, 2011; Yang *et al.*, 2012). Users perceive high levels of relative benefits when a new service provides greater value than others in terms of, for example, improved economic benefits, innovative functions, and convenient interfaces. In the SNS context, mobility, convenience, and other perceived benefits of SNSs contribute to the enhancement of user satisfaction. For example, Facebook offers benefits in mobility and convenience over other SNSs or communication tools because users can keep in touch with their friends and share their information anytime and anywhere. Thus, the perceptions of users' relative benefits can encourage user satisfaction with an SNS:

H3a. Perceived relative benefits have a positive effect on user satisfaction.

Perceived enjoyment is the degree to which an activity is perceived to be enjoyable, aside from any performance consequences (Davis *et al.*, 1992). Pleasurable and fun experience with a particular IS plays an important role in users' decision-making processes. Creating a pleasurable experience with a certain IS evokes a favorable attitude toward it, which in turn leads to a high level of satisfaction with the IS. A number of studies on hedonic-oriented ISs have confirmed the significant effect of perceived enjoyment in shaping user satisfaction (e.g. Gerow *et al.*, 2013; Kim, 2012; Lu *et al.*, 2010). Several works on SNSs have highlighted that individuals employ SNSs to fulfill hedonic needs (Kim, 2011; Lin and Lu, 2011; Sun *et al.*, 2014). Indeed, Facebook provides several entertaining functions, such as the Like button, social games, and photo sharing. Fun derived from using SNSs is expected to have a positive effect on user satisfaction. Therefore, we hypothesize the following:

H3b. Perceived enjoyment has a positive effect on user satisfaction.

2.2.3 Trust belief. From the view point of dedication-based relationship development, users develop trust in an SNS provider based on their perceptions of that provider's trustworthiness. Trust belief refers to a "user's willingness to be vulnerable to the actions of another party based on the positive expectation that the other party will

carry out a certain particular action important to the truster, irrespective of the thruster's monitoring ability" (Dwyer *et al.*, 2007). In the SNS context, trust belief in a service provider involves provider security and privacy issues (Fogel and Nehmad, 2009; Shin, 2010). Several works on SNSs have confirmed that users' trust belief is critical in mitigating the effects of privacy concerns and maintaining long-term relationships with an SNS (Lin and Liu, 2012; Shin, 2010; Sun *et al.*, 2014). In particular, SNS users unconsciously expose personal information such as movie and music preferences, political views, and visited places when publishing such information as photos or videos. According to a user survey on Facebook conducted by the Pew Internet & American Life Project (2013), 91 percent of users post their photos, up from 79 percent in 2006, and 71 percent post the city of the town in which they live, up from 61 percent in 2006. Such SNS providers as Facebook, Google+, and MySpace can easily assess user private information such as birthdays, political views, and hobbies by analyzing users' patterns of likes, comments, and clicks to carry out targeted advertising and improve user experience. Moreover, Facebook has been developing new technology to track users' cursor movements to better understand user patterns (Techworld.com, 2013). Users may fear that their SNS providers will illegally gather and sell their private information to third parties (Lin and Liu, 2012; Tan *et al.*, 2012). Trust in an SNS provider helps users reduce such concerns and encourages them to continue using the SNS. Trust belief is therefore expected to be significantly related to user satisfaction, as well as continuance intention:

H4a. Trust belief has a positive effect on continuance intention.

H4b. Trust belief has a positive effect on user satisfaction.

2.3 The constraint-based mechanism

2.3.1 Perceived switching costs. Perceived switching costs are defined as user perceptions of the time, money, and psychological efforts related to transferring from one service provider to another (Jones *et al.*, 2000). Switching costs encompass costs associating with time, money, and psychological aspects. These costs are due to prior commitments to the incumbent service in terms of specific economic, emotional, and psychological investments (Burnham *et al.*, 2003; Sharma and Patterson, 2000). Thus, users are likely to avoid new services to economize on switching costs. According to the dual model (Kim and Son, 2009), switching costs are a key factor in the constraint-based mechanism. Since IS users invest much effort and time in learning relevant functions and uploading personal information, transferring to another service is not easy (Kim and Gupta, 2012; Kim *et al.*, 2013; Polites and Karahanna, 2012). Previous IS works have verified that switching costs enhance users' continuance intention beyond what is explained by user satisfaction (Bhattacherjee *et al.*, 2012; Ray *et al.*, 2012; Zhou and Lu, 2012). SNS providers can consider developing users' perceived switching costs because these would inhibit users from switching away to other SNS providers. For example, the switching costs of Facebook mean the expected costs of switching from Facebook to an alternative SNS. Users are motivated to stay with Facebook because they are familiar with its characteristics and functions. Thus, perceived switching costs positively affect continuance intention by discouraging them from changing service providers:

H5. Perceived switching costs have a positive effect on continuance intention.

2.3.2 Antecedents of perceived switching costs. Learning is defined as the time and effort of acclimatizing to new skills and functions to use a new service effectively (Alba and Hutchinson, 1987). Learning is considered service-specific investments that are related to a user's history of interacting with a certain IS (Burnham *et al.*, 2003; Kim and Son, 2009; Polites and Karahanna, 2012; Zhou *et al.*, 2012). While much time and effort are required to learn the features and procedures of an SNS the first time due to the many different features and manipulation methods, users' skills, and know-how of a certain SNS are not hard to apply to other SNSs. Moreover, SNS users must expend time and effort to find their friends and recreate their social networks. Thus, several studies have confirmed that learning plays a significant role in developing switching costs (Kim and Son, 2009; Ray *et al.*, 2012). Thus, the learning required to use an SNS is expected to be positively associated with perceived switching costs:

H6a. Learning has a positive effect on perceived switching costs.

Network size is defined as the number of people that a user is connected to through a certain SNS. From the perspective of network externalities, once the number of users reaches a critical mass, a network benefit emerges and attracts more users to register (Lin and Bhattacherjee, 2008). The number of active members in a user's "buddy list" is a critical network externality factor (Chang *et al.*, 2013; Chun and Hahn, 2007; Lu *et al.*, 2013). Several studies point out that interactive IS services such as instant messaging services and SNSs display strong network effects, since users often base their decisions on the number of their friends, colleagues, or others in their social circle who use the target IS (Lin and Bhattacherjee, 2008; Zhou and Lu, 2011). In this regard, many studies have elucidated the significant impacts of network size on user decision-making processes regarding an interactive IS (Lu *et al.*, 2010; Zhou and Lu, 2011). In the SNS environment, network externalities are a vital source of improving perceived switching costs (Chang *et al.*, 2013; Lu *et al.*, 2013). The more friends, colleagues, or others who join an SNS, the more users can develop perceived switching costs. This means that a larger network size makes it harder for SNS users to transfer to another SNS. Thus, the number of other users using an SNS is significantly associated with perceived switching costs:

H6b. Network size has a positive effect on perceived switching costs.

2.3.3 Social norms. The theory of planned behavior (Ajzen, 1991) is a well-established model that elucidates user behavior across a variety of IS models. The model recognizes subjective norms as a critical antecedent that influences user decision-making processes in an IS environment. Social norms are defined as a user's perception of whether significant reference individuals would approve or disapprove of that user performing a given behavior (Ajzen and Fishbein, 1980; Mathieson, 1991). Social norms reflect social pressure from relatives, friends, and colleagues concerning a user's adoption and use intention about a certain IS. Venkatesh and Brown (2001) revealed that relevant others such as friends, family, and other important connections serve as the key predictors in a user's decision to utilize a home PC. A number of studies have confirmed the saliency of social norms in user decision-making processes in a post-adoption IS environment (Chang *et al.*, 2013; Kim, 2011; Lu *et al.*, 2013). In the SNS context, social norms refer to the degree to which users perceive that others approve of their SNS usage (Lu *et al.*, 2013). Given social

norms, users perceive social pressure to frequently maintain and manage their social networks to conform to the expectations of important others (Cheung *et al.*, 2011). Based on social influence theory (Kelman, 1958), when a majority of important others recommend that users register and use SNS, users may comply with the suggestion. Therefore, this study proposes the following hypotheses:

H7a. Social norms have a positive effect on actual usage.

H7b. Social norms have a positive effect on continuance intention.

Finally, our proposed model is tested with two control variables, age, and gender. Several IS studies have shown that demographic variables such as gender and age play an important role in users' decision-making processes (Kim and Han, 2009; Muscanell and Guadagno, 2012; Venkatesh and Brown, 2001). Age and gender differences in SNS use have also been examined by Barker (2009), Muscanell and Guadagno (2012), and Thelwall *et al.* (2010), with men likely to be more aggressive than women. Thus age and gender can influence actual SNS usage. Therefore, this study explicitly controls for the direct effects of age and gender on actual usage.

3. Research methodology

3.1 Instrument development

Measurement items for all constructs were borrowed from previously validated measures and modified to fit the SNS context. The questionnaire was composed of three parts. The first part asked respondents how long they had used Facebook. The second part measured the main constructs of the research framework. All items except age, gender, and actual usage were measured on a seven-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (7). The last part of the questionnaire asked demographic information such as age, gender, and income. Before the main survey was conducted, the measurement items were reviewed by three researchers in IS and marketing to identify problems with wording, content, and comprehension. After we changed the questionnaire based on their comments, the modified questionnaire was tested on 25 university students. Because Cronbach's α for each construct exceeded 0.70, a main survey was conducted. The survey items and their sources in the literature are listed in Appendix.

3.2 Sample and data collection

A great part of the limitations of SNS studies is known to be associated with data collection, which is limited to younger people such as university students and teenagers. Although teenagers and working adults present the largest user group, it is hard to generalize the analysis results to other SNS user populations. To overcome this problem, we collect data from a commercial online survey provider with a number of panels in South Korea, due to its wide distribution of ages and low sample bias. Only after completing all items on the previous page could panels move on to the questions on the next page. A total of 280 respondents with Facebook experience answered the survey. After the deletion of insincere responses through data filtering, 250 responses were included in the final sample. Among the sample, 50 percent were male. Consistent with our expectations, the respondents' ages ranged from 14 to 63 years, with a mean age of

33.27 and a standard deviation of 12.61. Table I reports detailed demographic information on the final sample.

4. Research results

A partial least squares method was used to test the psychometric properties of the measurement scales and to test the proposed hypotheses. This method is well suited for a research model with formative constructs and for complex models with numerous constructs (Chin, 1998; Hair *et al.*, 2012). Moreover, it has several benefits in terms of minimal restrictions on sample size and residual distributions. We therefore adopt this method to handle formative indicators and a number of constructs. Analysis takes place in two stages: an assessment of the validity and reliability of the measurement model and an assessment of the structural model.

4.1 Measurement model

Confirmatory factor analysis was conducted to assess the psychometric properties of the measurement items. We examined convergent validity, reliability, discriminant validity, and common method bias. To check for convergent validity, we investigated the item weights and loadings of the measurements, as shown in Table II. The formative and reflective constructs were treated differently. For formative constructs, the item weights were used to assess the contribution of each item corresponding to the constructs. The formative items of this study, AUS1 and AUS2, contribute substantively to their corresponding constructs. For reflective constructs, convergent validity is acceptable if the item loading exceeds 0.60 (Hair *et al.*, 1998). In this study, the lowest item loading was 0.776, thus satisfying with the convergent validity. To verify the reliability of the constructs, the composite reliability (CR) and average variance extracted (AVE) values were assessed. Reliability is acceptable if the CR is 0.70 or higher and the AVE is 0.50 or higher (Fornell and Larcker, 1981). According to Table III, all AVE and CR values have acceptable values. With respect to discriminant validity, the correlations between constructs should be lower than the square root of the AVE values of the individual constructs (Fornell and Larcker, 1981). As shown in Table III, the square roots of the AVE values were greater than the off-diagonal elements, confirming discriminant validity. Lastly, to check for the common method bias due to self-reporting, we evaluated the variances of the indicators of nine constructs (Liang *et al.*, 2007). As shown in Table IV, the average substantive variance in the indicators of constructs was 0.793, while the average method-based variance was 0.009. The ratio of the substantive to the method

Table I. Demographic data for respondents

Demographics	Item	Subjects	
		Frequency	%
Gender	Male	125	50
	Female	125	50
Age	Less than 20	51	20.4
	20-29	55	22.0
	30-39	54	21.6
	40-49	56	22.4
	More than 50	34	13.6
Annual income	6 months	88	35.2
	6 months-1 year	105	42.0
	More than 1 year	57	22.8

Construct	Item	Mean	SD	Factor weight	Factor loading	CR	AVE
Actual usage	AUS1	5.092	1.495	0.818			
	AUS1	3.044	1.558	0.273			
Continuance intention	CIN1	5.080	1.190		0.916	0.949	0.823
	CIN2	4.704	1.222		0.886		
	CIN3	4.960	1.147		0.896		
	CIN4	5.052	1.196		0.931		
User satisfaction	USA1	4.852	1.161		0.909	0.940	0.796
	USA2	4.828	1.056		0.882		
	USA3	4.864	1.140		0.895		
	USA4	4.912	1.179		0.884		
Perceived relative benefits	PRB1	4.924	1.147		0.929	0.954	0.838
	PRB2	4.748	1.234		0.945		
	PRB3	4.764	1.170		0.911		
	PRB4	4.672	1.170		0.929		
Perceived enjoyment	PEN1	4.808	1.177		0.929	0.949	0.862
	PEN2	4.620	1.263		0.945		
	PEN3	4.864	1.218		0.911		
Trust belief	TBE1	4.928	1.217		0.864	0.895	0.739
	TBE2	4.188	1.440		0.806		
	TBE3	4.516	1.200		0.906		
Perceived switching costs	PSC1	4.692	1.114		0.776	0.880	0.646
	PSC2	4.416	1.103		0.831		
	PSC3	4.480	1.249		0.831		
	PSC4	4.412	1.293		0.776		
Learning	LEN1	4.376	1.272		0.911	0.939	0.838
	LEN2	4.528	1.193		0.923		
	LEN3	4.312	1.341		0.913		
Network size	NSI1	5.420	1.088		0.836	0.880	0.710
	NSI2	4.768	1.236		0.827		
	NSI3	5.180	1.132		0.865		
Social norms	SNO1	4.568	1.288		0.898	0.936	0.830
	SNO2	4.476	1.354		0.927		
	SNO3	4.616	1.346		0.909		

Table II.
Scale reliabilities

Table III.
Correlation matrix and discriminant assessment

	1	2	3	4	5	6	7	8	9	10	11
1.Continuance intention	0.907										
2. User satisfaction	0.745	0.892									
3. Perceived relative benefits	0.679	0.647	0.915								
4. Perceived enjoyment	0.706	0.680	0.658	0.928							
5. Trust belief	0.584	0.645	0.547	0.533	0.860						
6. Perceived switching costs	0.364	0.320	0.328	0.239	0.257	0.804					
7. Learning	0.152	0.064	0.144	0.112	0.068	0.345	0.915				
8. Network size	0.478	0.499	0.584	0.579	0.512	0.245	0.069	0.843			
9. Social norms	0.578	0.495	0.618	0.602	0.425	0.228	0.168	0.457	0.911		
10. Age	0.108	0.095	0.101	0.069	−0.012	−0.053	0.200	−0.008	0.103	1.000	
11. Gender	−0.116	−0.176	−0.142	−0.103	−0.139	−0.042	0.010	−0.042	−0.081	−0.060	1.000

Note: Diagonal elements are the square root of AVE

Construct	Item	Substantive factor loading (R1)	$R1^2$	Method factor loading (R2)	$R2^2$
Continuance intention	CIN1	0.813***	0.661	0.113	0.013
	CIN2	0.874***	0.764	0.017	0.000
	CIN3	1.017***	1.034	−0.138	0.019
	CIN4	0.928***	0.861	0.003	0.000
User satisfaction	USA1	0.841***	0.707	0.078	0.006
	USA2	1.012***	1.024	−0.148*	0.022
	USA3	0.865***	0.748	0.036	0.001
	USA4	0.857***	0.734	0.029	0.001
Perceived relative benefits	PRB1	0.808***	0.653	0.081	0.007
	PRB2	0.902***	0.814	0.031	0.001
	PRB3	0.970***	0.941	−0.038	0.001
	PRB4	0.979***	0.958	−0.070	0.005
Perceived enjoyment	PEN1	0.975***	0.951	−0.053	0.003
	PEN2	0.958***	0.918	−0.014	0.000
	PEN3	0.851***	0.724	0.068	0.005
Trust belief	TBE1	0.683***	0.466	0.211***	0.045
	TBE2	0.989***	0.978	−0.210***	0.044
	TBE3	0.923***	0.852	−0.016	0.000
Perceived switching costs	PSC1	0.735***	0.540	0.084	0.007
	PSC2	0.897***	0.805	−0.084	0.007
	PSC3	0.932***	0.869	−0.167*	0.028
	PSC4	0.645***	0.416	0.199**	0.040
Learning	LEN1	0.902***	0.814	0.010	0.000
	LEN2	0.936***	0.876	−0.031	0.001
	LEN3	0.908***	0.824	0.021	0.000
Network size	NSI1	0.825***	0.681	0.002	0.000
	NSI2	0.927***	0.859	−0.110	0.012
	NSI3	0.779***	0.607	0.107	0.011
Social norms	SNO1	0.892***	0.796	0.009	0.000
	SNO2	0.982***	0.964	−0.075	0.006
	SNO3	0.859***	0.738	0.066	0.004
Average			0.793		0.009

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table IV.
Common method bias analysis

variance was 88.11:1. Given the small magnitude and insignificance of the method-based variance, common method bias is not a serious concern in our study.

4.2 Structural model

We tested the research framework using a bootstrap resampling procedure with 500 resamples. The analysis results are presented in Figure 2. Users' continuance intention was found to have a significant impact on actual usage, resulting in supporting *H1*. User satisfaction significantly influences users' continuance intention, supporting *H2*. Both perceived relative benefits and perceived enjoyment are significantly related to user satisfaction, verifying *H3a* and *H3b*. Trust belief was found to significantly affect users' continuance intention, as well as user satisfaction, thus supporting *H4a* and *H4b*. Perceived switching costs were found to play a significant role in developing users' continuance intention, thus supporting *H5*. Learning and network size were found to be significantly associated with perceived switching costs, supporting

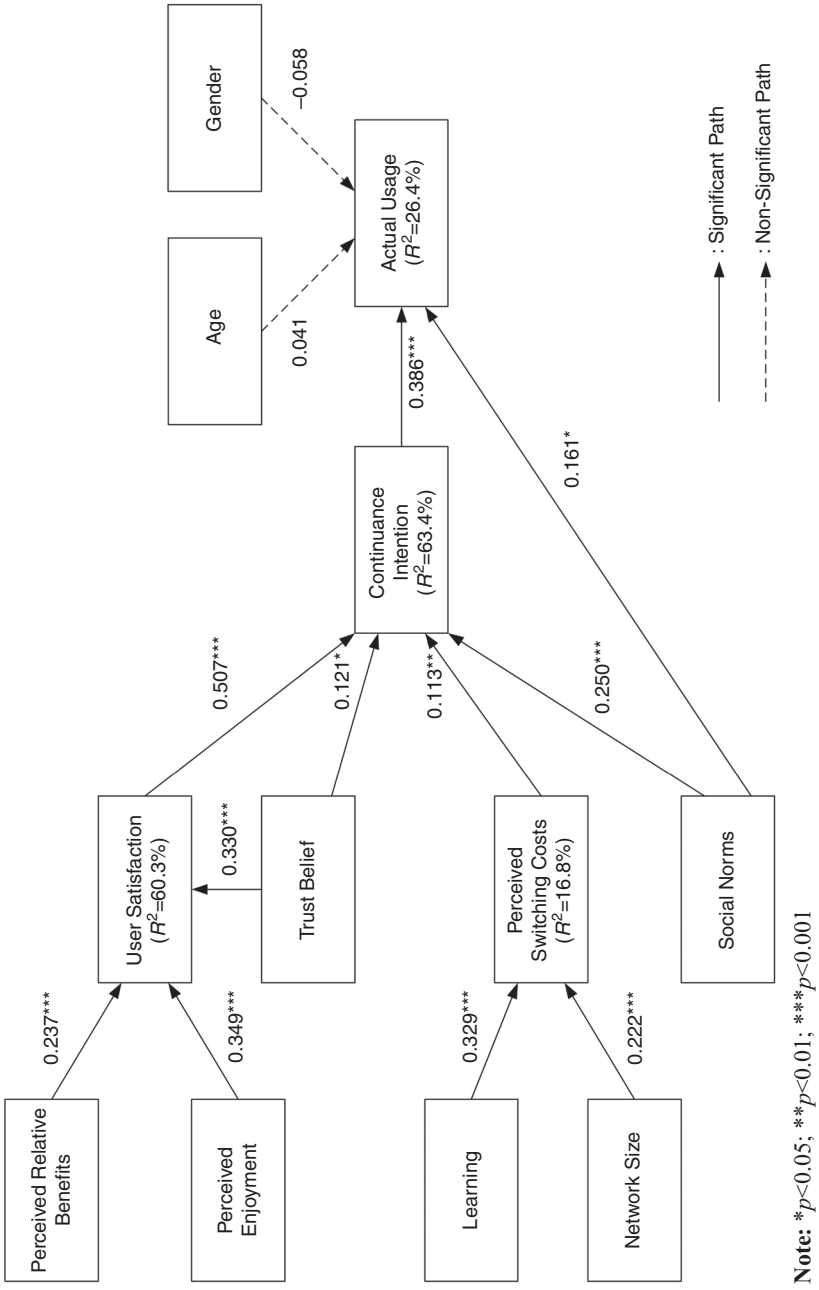

Figure 2.
Analysis results

H6a and *H6b*. Consistent with our expectations, the effects of social norms on users' continuance intention and actual use are significant. Therefore, *H7a* and *H7b* are supported. However, age and gender are not significantly associated with actual usage. The proposed theoretical model accounts for 26.4 percent of the variance in the actual use of SNS users. Table V summarizes the results.

4.3 Summary of results

Drawing upon a dual model perspective, this study describes why SNS users continue to use the SNS or resist changing to another SNS. The research framework asserts that SNS users' continuance intention is determined by both dedication- and constraint-based mechanisms. The findings of this study indicate that the two mechanisms are significant predictors of SNS users' continuance intention, accounting for 63.4 percent of its variance. The analysis results show that dedication- and constraint-based mechanisms act as independent predictors of the formation of SNS users' continuance intention. In particular, users' continuance intention is largely explained by user satisfaction and trust belief, implying that the dedication-based mechanism is a stronger predictor of users' post-adoption behaviors than the constraint-based mechanism is.

In the dedication-based mechanism, both perceived relative benefits and perceived enjoyment are found to be the key antecedents of user satisfaction. When users experience high levels of benefit and enjoyment with an SNS, they are more likely to be dedicated to use it. In line with our expectations, trust belief significantly influences user satisfaction. This study clarifies the significant effects of trust belief on user satisfaction and continuance intention. Moreover, this study explores the key determinants of perceived switching costs in the SNS environment. Learning and network size, as a constraint-based mechanism, play an import role in developing users' perceptions of switching costs. When users feel that it takes time to learn how to use a new SNS and a number of their friends have already registered with an SNS, they are more likely to stay with the SNS than to switch to a new one. The analysis results confirm that learning and network size serve as key antecedents to shaping the switching costs of SNSs. Social norms are positively related to both users' continuance intention and actual usage. This study finds that social norms, as a constraint-based mechanism, provide a notable amount of explanatory power for SNS users' continuance behavior.

5. Conclusions

5.1 Implications for research

This study provides several theoretical implications. First, one major contribution of this study is the development of a theoretical framework investigating the effects of dedication- and constraint-based mechanisms on users' post-adoption behavior in the SNS context. The analysis results reveal that SNS users' post-adoption behaviors are guided by two mechanisms: user satisfaction with the SNS and trust belief in the SNS, as determined by the benefits of a long-term mutual relationship, and perceived switching costs and social norms that make it difficult for the user to transfer to an alternative SNS. Both dedication- and constraint-based factors explain the considerable variance in SNS users' continuance intention. By adapting the dedication-constraint framework to the SNS context, we advance our understanding of SNS users' post-adoption behaviors.

Second, the study sheds light on the impacts of dedication-based mechanisms by investigating the key antecedents of user satisfaction. Perceived relative benefits and

Table V.
Summary of the results

	Effect	Cause	Coefficient	*t*-value	Hypothesis
H1	Actual usage	Continuance intention	0.386	6.090	Supported
H2	Continuance intention	User satisfaction	0.507	8.545	Supported
H3a	User satisfaction	Perceived relative benefits	0.237	3.793	Supported
H3b	User satisfaction	Perceived enjoyment	0.349	7.072	Supported
H4a	Continuance intention	Trust belief	0.121	2.150	Supported
H4b	User satisfaction	Trust belief	0.330	5.491	Supported
H5	Continuance intention	Perceived switching costs	0.113	2.571	Supported
H6a	Perceived switching costs	Learning	0.329	4.515	Supported
H6b	Perceived switching costs	Network size	0.222	3.477	Supported
H7a	Actual usage	Social norms	0.161	2.196	Supported
H7b	Continuance intention	Social norms	0.250	4.175	Supported
	Actual usage	Age	0.041	0.645	Rejected
	Actual usage	Gender	−0.058	0.950	Rejected

perceived enjoyment play an important role in enhancing user satisfaction. The analysis results show perceived relative benefits and perceived enjoyment play a prominent role in improving user satisfaction with SNSs. Perceived enjoyment has a more positive impact on user satisfaction than perceived relative benefits do. This means that a hedonic factor has more explanatory power than a utilitarian- factor on SNS post-adoption behavior, because the impact of a hedonic factor becomes stronger with direct user experience with the SNS. Additionally, this study reveals that trust belief positively affects SNS users' continuance intention in two ways: by indirectly influencing users' continuance intention via user satisfaction and by directly influencing users' continuance intention. The results of this study provide rich insights into the way dedication-based factors influence users' continuance intention toward an SNS.

Third, this study sheds light on the effects of constraint-based mechanisms on users' continuance intention. This study provides an in-depth understanding of the key antecedents of perceived switching costs in the SNS environment. The research model posits learning and network size as the key predictors of perceived switching costs. Consistent with the results of previous SNS studies, this study confirms the saliency of learning and network size in elucidating perceived SNS switching costs. To economize on learning costs and to continue connecting with friends, SNS users are hesitate to change their service. The number of users connected through a current SNS helps SNS providers develop switching costs. Moreover, social norms are not significantly associated with continuance intention or actual usage. This finding can be explained by the importance of social pressure from relatives, friends, and colleagues to use an SNS. Users can easily keep in touch with their friends when they register with the same SNS. Specifically, this study reveals that social norms directly affect actual usage. These analysis findings provide preliminary evidence of the significant impacts of constraint-based mechanisms on the formation of users' post-adoption behaviors toward SNSs.

5.2 Implications for practice

The results of this study provide SNS practitioners with a great deal of insight into how to enhance users' post-adoption behaviors. First, this study suggests that users' post-adoption behaviors will develop according to well-managed dedication- and constraint-based mechanisms. Specially, the findings of this study advise SNS practitioners to focus on dedication-based mechanisms, involving user satisfaction and trust belief, which has a greater impact on users' continuance intention than constraint-based mechanisms. This is because almost SNSs have homogeneous features, interfaces, and functions and user can easily change their current SNS to another one for free. Given that the dedication-based mechanism contributes to users' desire to engage in long-term relationships, SNS predictors need to pay attention to improving trust belief. Privacy concerns can inhibit the development of a long-term relationship with an SNS. Since most SNS users worry about the security of their personal information, such as political views and current location, SNS practitioners try to mitigate their fears of losing control over their private information.

Another practical implication is that understanding the prominent antecedents of user satisfaction can help SNS practitioners enhance user satisfaction. To strengthen relationships with current users, SNS provider must recognize the importance of perceived relative benefits and perceived enjoyment. Users continuously compare new and available services and choose the one with better quality. Thus, SNS practitioners try to develop innovative features that are hard for other SNSs to replicate. In this regard, Facebook offers a set of application programming interfaces(APIs) so that

third-party developers can create their own applications on the Facebook platform. More than 10,000 applications have been developed using Facebook's API. From the hedonic view, SNS providers should focus on enriching users' entertaining and pleasant experiences. In Facebook's case, more than 40 game developers, including Zynga and Electronic Arts, have launched several game titles, such as City Ville, Poker, and FIFA, on the Facebook platform. According to SNS experts, games are an excellent way of keeping SNS users more active and happy. These entertaining experiences with the SNS evoke positive feeling toward the service, which leads to the user's long-term relationship with the service provider.

The last practical implication is that understanding the prominent antecedents of perceived switching costs can help SNS practitioners manipulate their switching barriers. To retain users, SNS practitioners should manage switching costs. Facebook users can easily change to an alternative SNS, such as Google+ or Twitter, because competing SNSs can be adopted without cost. The results of this study suggest that SNS providers wishing to discourage their users from transferring to an alternative SNS must pay attention to increasing network size by attracting potential adopters and retaining current users. Moreover, SNS practitioners increase switching costs by providing user-friendly application interfaces, categories, and menus.

5.3 Limitations and further works

We should address the following limitations. First, this study is based on cross-sectional data and therefore it is hard to capture a causal relationship between the constructs. Hence, further research could benefit from a longitudinal investigation to determine the clear causal impacts of dedication-and constraint-based factors on users' post-adoption behaviors. Second, even if Facebook is used worldwide, we collected data from only a single country. Several works on SNS have shown that cultural characteristics can influence users' decision-making processes (e.g. Kim *et al.*, 2011; Ku *et al.*, 2013). To reflect the cultural elements of Facebook users, further research should conduct a survey in several countries to improve the validity and generality of the results.

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Further reading

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Appendix. List of model constructs and items

Actual usage is derived from Kim *et al.* (2005).
AUS1: On average, how frequently have you used Facebook?
(1) Once three months; (2) Once two months; (3) Once a month; (4) 2-5 times a month; (5) 2–5 times a week; (6) Once a day; (7) Several times a day.
AUS2: On average, how much time do you spend using Facebook over one month?
(1) Less than 5 min; (2) 5-10 min; (3) 10-30 min; (4) 30 min-1 hour; (5) 1-2 hours; (6) 2-5 hours; (7) More than 5 hours.

Continuance intention is derived from Bhattacherjee (2001).
CIN1: I intend to continue my use of Facebook in the future.
CIN2: I intend to increase my use of Facebook in the future.
CIN3: I will keep using Facebook as regularly as I do now.
CIN4: If I could, I would like to continue my use of Facebook.
User satisfaction is derived from Bhattacherjee (2001).
How do you feel about your over experience with Facebook use?
USA1: Very dissatisfied/Very satisfied.
USA2: Very displeased/Very Pleased.
USA3: Very frustrated/Very contented.
USA4: Absolutely terrible/Absolutely delighted.

Perceived relative benefits are derived from Kim *et al.* (2009).
PRB1: Facebook has more advantages than other SNSs because I can easily interact with other people.
PRB2: Facebook is more convenient than other SNSs.
PRB3: Facebook is more efficient than other SNSs.
PRB4: Facebook is more effective than other SNSs in connecting with others.

Perceived enjoyment is derived from Davis *et al.* (1992).
PEN1: Using Facebook is pleasurable.
PEN2: I have fun with using Facebook.
PEN3: I find using Facebook to be interesting.

Trust belief is derived from Fogel and Nehmad (2009).
TBE1: Facebook is a trustworthy service provider.
TBE2: I can count on Facebook to protect my privacy.
TBE3: Facebook can be relied onto keep its promises.
Perceived switching costs are derived from Kim and Son (2009).

PSC1: Switching to a new SNS would involve some hassle.
PSC2: Some problems may occur when I switch to another SNS.
PSC3: It is complex for me to change SNSs.
PSC4: If I stop using Facebook, I will waste a lot of the effort that I have already made in this mobile SNS.

Learning is derived from Kim and Son (2009).
LEN1: Learning to use the features offered by Facebook took a lot of time and effort.
LEN2: There was a lot involved for me to understand Facebook well.
LEN3: I spent a lot of time and effort to learn how the "system works" at Facebook.

Network size is derived from Lin and Lu (2011).
NSI1: I think a good number of people use Facebook.
NSI2: I think most people are using Facebook.
NSI3: I think there will still be many people joining Facebook.

Social norms are derived from Mathieson (1991).
SNO1: People who are important to me want me to use Facebook.
SNO2: People who influence my behavior think I should use Facebook.
SNO3: People whose opinions I value prefer me to use Facebook.

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