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The push, pull and mooring effects in virtual migration for social networking sites

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Abstract. *Social networking sites (SNSs) have become increasingly common in recent years, and their use has become integrated into the daily lives of millions of people across the world. Attracting new users and retaining existing ones are critical to the success of SNS providers. This study applies the push-pull-mooring model of the migration theory to improve our understanding of factors that influence the switching behavior of SNS users. Following the migration theory, this study empirically examines the three categories of antecedents for SNS switching intention: push (i.e., dissatisfaction and regret), pull (i.e., alternative attractiveness), and mooring (i.e., switching costs) factors. The results show that the three categories of factors had varying degrees of effects on switching intention. Additionally, the strong moderation effects of both pull and mooring factors help answer the question why switching does not necessarily occur when push factors are in effect. Managerial implications are provided.*

Keywords: social networking sites, regret, satisfaction, switching costs, alternative attractiveness, migration theory

INTRODUCTION

Mass collaboration is currently easier in the Web 2.0 environment (White *et al*., 2010). Web 2.0 applications allow people to build and maintain social networks online. Social networking sites (SNSs) have become regarded as one of the main successes of the internet in recent years (Cheng *et al*., 2009). SNSs allow users to create profiles and articulate and communicate with others (Boyd & Ellison, 2007). This type of medium provides users with a public platform for the digital exchange of information (Sledgianowski & Kulviwat, 2008). The majority of SNS providers rely on online advertising revenues and attempt to increase network externalities to attract interested firms for marketing and advertising (Sledgianowski & Kulviwat, 2009). Facebook, Friendster, LinkedIn, LiveJournal, and MySpace are among the SNSs that have been extensively and commonly used (Brady *et al*., 2010) with millions of registered members

who access these SNSs as part of their daily lives (Boyd & Ellison, 2007). Moreover, various smaller and specialized SNSs have emerged over the past few years, providing living proofs of the success of this new business model (Costa, 2008). However, several SNS services with less traffic were discontinued under this fiercely competitive environment (Cheng *et al*., 2009); thus, it is crucial for SNS providers to continuously attract and retain users to remain competitive.

Several extant studies have focused on various aspects of social networking on the internet. Examples include the primary functions of SNSs in the management of social networks (Ellison *et al*., 2007); self-presentation through profiles (Liu, 2007); the proliferation of special interest networks (Ploderer *et al*., 2008); network structure (Maia *et al*., 2008); and privacy, security, and trust issues (Dwyer *et al*., 2007). However, to the best of our knowledge, empirical studies that examine factors that affect the switching intentions of SNS users are still quite limited. Understanding the factors that affect switching intentions is essential because user migration is critical to the success of an SNS.

Regret has been suggested as a critical affective consequence in decision making. People regret their decisions as they realize that an alternative choice would have resulted in a better outcome (Tsiros & Mittal, 2000; Zeelenberg, 1999). Zeelenberg (1999) defines regret as 'the negative, cognitively based emotion that we experience when realizing or imagining that our present situation would have been better had we acted differently'; that is, regret is experienced after a wrong decision is chosen and expected results are not produced (Zeelenberg & Pieters, 1999, 2004; Liao *et al*., 2011). However, the role of regret in the virtual world is less known. SNS users who regret from adopting the services may have a higher probability of being dissatisfied, which could ultimately lead to a decision to switch to a different service provider. Therefore, this study examines dissatisfaction and regret to understand how these factors affect the switching behavior of SNS users.

As competition and costs of attracting new customers increase, companies primarily require focusing their strategic efforts on preventing the switching intentions of users (Zhang *et al*., 2009). Attractiveness of services provided by competitors may influence a user's intention to switch, while the lack of a strong competitor could be a reason of existing users to stay. In this latter case, users may gradually abandon their existing SNSs when a more attractive alternative is available. Therefore, the motivation for continuing an unsatisfactory relationship diminishes in the presence of a highly attractive alternative (Sharma & Patterson, 2000). Even when users are satisfied and not regretful with their choice of existing SNS, they may still switch to another SNS that is more attractive; that is, both being satisfied and not having regret do not necessarily prevent users from switching to alternatives (Reichheld, 1996; Woodruff, 1997). Moreover, users may consider the cost of switching when they encounter an attractive alternative SNS service (Cheng *et al*., 2009). Users may not switch from their current SNS even when a new SNS service is appealing because the change may be too costly (in both tangible and intangible forms). Therefore, the pull factor (alternative attractiveness) and mooring factors (switching costs) may directly influence switching intentions. Moreover, these two factors were regarded as moderators of the relationships between push factors (regret and satisfaction) and switching intentions. Push factors (dissatisfaction and regret), pull factors (alternative attractiveness), and mooring factors (switching costs) can provide a better understanding of the switching behaviors of SNS users.

The push-pull-mooring (PPM) model originates from human migration studies (Lee, 1966; Moon, 1995). The three components of this model include the push (negative factors at the origin that push an individual away), pull (positive factors at the destination that pull an individual toward it), and mooring factors (personal and social factors that facilitate or hamper the migration decision) (Bansal *et al*., 2005; Moon, 1995). SNS users are like SNS 'residents' who use one service provider and possibly migrate to another provider when it becomes a better alternative. When users switch between SNS providers, they analogically 'migrate' between different SNS providers, and therefore, the SNS switching behavior can be treated as *migration* among SNSs; a human migration model is thus relevant for analyzing switching between SNSs.

As with many human migrations, switching among SNSs takes a gradual approach that starts from one user testing out a new service. If this goes favorably, it is then followed by a series of activities to motivate his or her circle of friends over to the new service. It is worth noting that the concept of switching in this present study refers to moving to a new provider as the person's primary SNS with or without a total cut-off of existing or other SNS services. This is similar to human migrations where one migrates to a new location while still maintains a financial or social tie to the environment of previous residence. This conception of switching is consistent with the existing literature in that the properties of products or services are frequently associated with specific forms of switching. For example, consumers unlikely own car insurance from multiple vendors, but they frequently do so with other types of products, such as credit cards and personal technologies (Ye *et al*., 2008; Ye & Potter, 2011). As they indicated, a switch entails a complete substitution in the former type of products, while it can be a partial/gradual substitution or even parallel use with a varying degree of emphasis for the latter type of products. SNS fits best as a technology product, where complete substitution is unlikely to happen overnight. Therefore, Ye and Potter's definition of switching as 'users' partial reduction or full termination in usage of a specific technology product while substituting it with usage of an alternative product that satisfies identical needs' (p. 587) is most relevant to our work.

Several studies have explored consumer switching behavior in marketing (Ganesh *et al*., 2000; Jones *et al*., 2000; Burnham *et al*., 2003; Bansal *et al*., 2005; Lopez *et al*., 2006; Anton *et al*., 2007). However, few studies in the internet service (IS) literature have empirically examined the motivating forces of SNS switching intention. Understanding why users switch SNS providers is an important research issue for practitioners. Therefore, we proposed and empirically tested a model of SNS switching behavior based on the three essential forces of the migration theory: push (i.e., dissatisfaction and regret), pull (i.e., alternative attractiveness), and mooring factors (i.e., switching costs). Moreover, we analyzed how pull and mooring factors moderate the relationships between push factors and switching intentions of SNS users. The findings in this study are expected to provide new insights into the roles of these critical variables.

LITERATURE REVIEW

SNSs

Social networking sites are a form of social media. The easily accessible social media have prompted a significant change in human social networks (Boyd & Ellison, 2007). SNSs are

Web-based communities that make it possible for users to easily share information through the internet. SNSs refer to the presence of machines and humans, indicating that humans are initially connecting to machines and then to people (Wellman *et al*., 1996). SNSs such as Facebook, MySpace, and Friendster have shown dramatic growth over the last few years. At the most basic level, SNSs allow users to create online profiles or personal homepages and communicate and interact with other members through interfaces such as chat rooms, online forums, and message boards. Moreover, SNSs allow members to create their own private social networks by adding friends, joining groups, and reviewing their list of connections (Boyd & Ellison, 2007). Users can search through the profiles of their social network, share information, and display what they desire other members to view on their profile. Moreover, members can customize the appearance of their personal page and add media content such as photos, videos, and music files, and share them with others (Dwyer *et al*., 2007).

Various issues along with using SNSs have attracted a recent surge of studies. Boyd & Ellison (2007), as one of the first SNS studies, focuses mostly on the networks, their structure, security and privacy issues, and the management of friends and online impressions. SNSs continue to be studied across a diverse range of disciplines (Boyd & Ellison, 2007). Insights regarding the switching behavior among SNSs are currently lacking. Understanding the factors that influence the switching intentions of SNS users is essential because the turnover of SNS users has a significant impact on SNS success (Cheng *et al*., 2009). The present study aims to offer one way to fill this gap.

Migration theory

Migration is defined as 'the movement of a person (a migrant) between two places for a certain period of time' (Boyle *et al*., 1998) and generally indicates a permanent or temporary (semi-permanent) change of residence (Lee, 1966). Permanent migration refers to a situation where people leave their place of origin forever, and temporary migration refers to a situation where people maintain their permanent place of residence but are away for a time (Jackson, 1986). Researchers of human geography differentiate between voluntary migrants and refugees. Voluntary migrants are people who can freely decide to migrate (Jackson, 1986), whereas involuntary migrants (refugees) have no choice but to migrate because of factors such as war, chaos, persecution, or natural disasters (Bansal *et al*., 2005; Boyle *et al*., 1998). SNS users can be divided into voluntarily and involuntary migrants. Voluntary migrants may freely choose to migrate (switch) between SNS service providers. Conversely, involuntary migrants (refugees) may have no choice but to migrate (switch) because their current SNS service is discontinued. This study examines the determinants of switching between different brands of SNS service providers (an analogous phenomenon to national migration).

PPM model of migration

The PPM model is regarded as the dominant paradigm in migration literature (Bansal *et al*., 2005). Ravenstein introduced the 'Laws of Migration' in 1885, which are regarded as the foundations of the push-pull model. Thereafter, the concept of mooring variables was proposed by Longino (1992), which Moon (1995) incorporated into a push-pull model of migration to explain

the migration of populations. This model is the most important theoretical contribution to migration literature to date (Jackson, 1986). The PPM model suggests that migrants' decisions to move from one geographic area to another are influenced by the PPM factors (Ravenstein, 1885; Moon, 1995; Zhang *et al*., 2008). Push factors are negative factors that compel people to leave their original place, whereas pull factors are positive factors that attract people to a destination (Moon, 1995). Mooring refers to lifestyle and cultural and spatial issues that behave as intervening variables, which facilitate or inhibit the decision to migrate (Moon, 1995).

The PPM model has been applied in other disciplines such as consumer behavior and marketing domains. Bansal *et al*. (2005) built a PPM model that provided a unifying framework for explaining consumer service switching behavior and advised researchers to use the PPM model to improve the understanding of such behavior. The PPM model can be applied to explain customer switching behaviors, which can assist marketers in mapping the competing forces that impact switches within their customer base (Cheng *et al*., 2009). Although consumer behavior and marketing literature have provided several useful insights into the phenomenon of consumer switching, previous research that sufficiently explained user switching between technology substitutes (e.g., SNS) is rare. Therefore, empirically examining factors that influence the switching behaviors of SNS users by using the PPM model is of both theoretical and practical interest. These results can assist SNS providers to retain users and prevent them from switching to other SNS services.

Switching behavior has been discussed for over a decade within the marketing discipline (Keaveney, 1995). Numerous studies emphasized customer switching in different service industries, such as credit card (Burnham *et al*., 2003), car insurance (Anton *et al*., 2007), auto-repair and hairstyling (Bansal *et al*., 2005), fixed-line telephone (Lopez *et al*., 2006), and banking services (Ganesh *et al*., 2000). However, only a few empirical studies examine and address the issues of switching behavior in the IS field (Ranganathan *et al*., 2006). Online service switching has recently attracted the attention of researchers and practitioners (e.g., Kim *et al*., 2006; Zhang *et al*., 2009 Hou *et al*., 2011; Hsieh *et al*., 2012). Unlike some products or services where uses are mostly tied to one single vendor (e.g., car insurance, landline telephone and hairstyling) at any given time, consumption of some other products (e.g., credit cards, bank accounts and SNSs) may not be limited to only one vendor. Therefore, switching in this latter type of products or services is more of focus shifting but less of a total substitution. Even in the case of total substitution, the process could be gradual, resulting in a concurrent use of multiple products for some periods.

Regret theory and satisfaction

When a consumer's perception of product performance meets the expected standard, satisfaction is confirmed (McKinney *et al*., 2002). Otherwise, disconfirmation occurs (Tsiros, 1998). The satisfaction construct has been used extensively in the migration literature (Bansal *et al*., 2005). Regret is a negative emotion that occurs when people identify a better alternative than the current one (Landman, 1987; Zeelenberg *et al*., 2000).

Regret and satisfaction both represent the regard toward a result after a comparison process (Tsiros & Mittal, 2000). However, regret is different from satisfaction from the psychological

perspective (Hung *et al*., 2007). Satisfaction results from the comparison between expected and actual performance. Regret is the performance comparison between the chosen and forgone alternatives (Tsiros, 1998; Tsiros & Mittal, 2000). Dissatisfaction occurs when the performance of a chosen product cannot meet a customer's expectations. Conversely, regret occurs when product performance is below a forgone alternative (Keaveney *et al*., 2007). Tsiros & Mittal (2000) indicated that satisfaction focuses on an expectation of a chosen alternative (internal perspective), whereas regret focuses on the performance of a forgone alternative (external perspective).

Regret and satisfaction were regarded as different concepts because regret was identified as an antecedent of satisfaction (Oliver, 1997). Furthermore, several existing studies show that these two constructs may both be experienced under certain conditions (Tsiros, 1998). Taylor (1997) examined regret and satisfaction simultaneously and discovered that regret significantly influences satisfaction. Inman *et al*. (1997) implemented an experimental study to examine the relationship between regret and satisfaction, and proved that regret affected customer satisfaction. Regret and satisfaction are different but can coexist simultaneously (Tsiros, 1998; Zeelenberg & Pieters, 1999, 2004; Tsiros & Mittal, 2000).

The relationship between dissatisfaction with a service provider and switching intentions is well documented (Zeelenberg & Pieters, 2004; Anton *et al*., 2007), whereas such a relationship between regret and switching intentions is still lacking. SNS users are likely to feel regret and result in switching to another SNS when users identify a better alternative even if they are satisfied with the current SNS. This present study considers not only dissatisfaction but also regret as determinants of switching intention.

Switching cost

Switching cost refers to the cost associated with changing service providers (Dick & Basu, 1994). Switching costs include economic, psychological, physical, and emotional sacrifices that may occur before, during, and after service conversion (Kim *et al*., 2006). These costs can be real, perceived monetary costs or nonmonetary costs, or a mixture of the two (Kotler & Andreasen, 1996).

Additionally, switching cost could be the intervening obstacles to inhibit SNS user's switching behavior even if they are regretful and dissatisfied with their current SNS. By moving to the new SNS, users might lose their link to their friends and need to spend extra time and effort to rebuild their profiles, and to invite their friends to join the move. All this can be a source of road blocks for switching. Goldenberg *et al*. (2009) explored the role of social hubs, which means a person with a large number of ties in adoption. The effect of social hubs on propagation of one's networks has been also studied for social networks. Lin & Lu (2011) examined the influence of network externalities including number of members, number of peers, and perceived complementarity, on continued intention to use SNS. Network externalities were found to be significant predictors of SNS use intention. An SNS user can group his or her friends across different SNSs and rate friends or activities as 'favorite', 'neutral', or 'disliked' (Wang & Vassileva, 2010), and may further influence their friends' switching intentions. An alternative SNS may

seem attractive because of preferences of one's friends. When a large number of friends recommend an alternative SNS, one may be more likely to switch to the new SNS. Therefore, switching cost and alternative attractive might directly influence switching intention and moderate the relationships between satisfaction and switching intention, and between regret and switching intention.

Switching costs have been broadly grouped into three categories: (i) sunk; (ii) setup; and (iii) continuity costs (Patterson & Smith, 2003). Sunk cost refers to previous investments (Rusbult, 1980), including time, emotional involvement, and money (Rusbult, 1980). People are constrained into certain actions because of past investments that may be lost if a behavior is terminated (Bechker, 1960). Sunk cost in the context of this study represents an individual's perception of non-recoupable time and effort invested in establishing and maintaining a relationship with a service provider (Patterson & Smith, 2003).

Setup cost can be actual economic cost and the required initial time, effort, and hassle for initiating the use of a particular new service provider (Jones *et al*., 2000; Patterson & Smith, 2003). Changing service providers often involves setup cost. Examples in real life include filling out forms when changing banks, paying membership fees when changing gyms, receiving new X-rays when changing dentists (Jones *et al*., 2000), and registering for a new account and building a new profile when changing SNS providers.

Continuity cost refers to the opportunity cost from lost performance benefits that are normally obtained through the specified knowledge developed by a service provider (Patterson & Smith, 2003). The continued patronage with a service provider normally leads to an accrual of benefits, which are lost if the relationship is terminated (Maute & Forrester, 1993). Moreover, there are several elements of perceived risk when an individual considers changing service providers: a new service provider may not perform the service at an equal or better level than the current service provider (Patterson & Smith, 2003). Continuity cost reflects the risks associated with changing service providers because the level of service that may be received from a new service provider is unknown (Aaker, 1991).

Attractive alternatives

Alternative attractiveness refers to 'customers' perceptions regarding the extent to which viable competing alternatives are available in the marketplace' (Jones *et al*., 2000). Customers' perceptions of the attractiveness of alternative service providers may be shaped through various information channels, including hearsay, word of mouth, commercials, and the media (Kim *et al*., 2006). A lack of attractive alternative offerings may be a favorable situation for defending customers and building customer loyalty (Ping, 1993). Less attractive alternatives may discourage customers from switching to other service providers (Kim *et al*., 2006). Customers may continue using their usual SNS even when it is perceived as unsatisfactory if they are unaware of attractive alternative service providers (Patterson & Smith, 2003). Nevertheless, customers may decide to switch to a new service provider if they perceive the alternative to be more attractive because of the availability of a better service (Sharma & Patterson, 2000).

RESEARCH MODEL AND HYPOTHESES

An aim of this study is to understand users' intentions to switch SNS service providers. The research model of this study is shown in Figure 1. Factors at the origin (regret and dissatisfaction) push the user away from the original SNS service provider, and factors at the destination (alternative attractiveness) pull the user toward the destination. Therefore, these factors correspond to push and pull effects. Moreover, certain factors compel SNS users to remain at their origin (i.e., switching costs); these factors can be represented as mooring effects. PPM variables all affect switching intentions. Nevertheless, a user may not switch, even with strong push effects, because both mooring and pull effects may constrain the switching decision, which act as moderators of the push effects.

Push factors: regret and dissatisfaction

Push factors refer to 'the factors that motivate people to leave an origin' (Stimson & Minnery, 1998). Regret and dissatisfaction correspond to push factors because regret and dissatisfaction are the negative factors that compel users to leave their current service provider. Lack of satisfaction and inducing regret experience are the primary reasons users are pushed away from a current service provider (Zeelenberg & Pieters, 2004; Bansal *et al*., 2005; Cheng *et al*., 2009). Previous studies have shown a positive relationship between satisfaction and repurchase/reuse intention (Chiu *et al*., 2007; Wang, 2008; Liao *et al*., 2011; Venkatesh *et al*., 2011). The

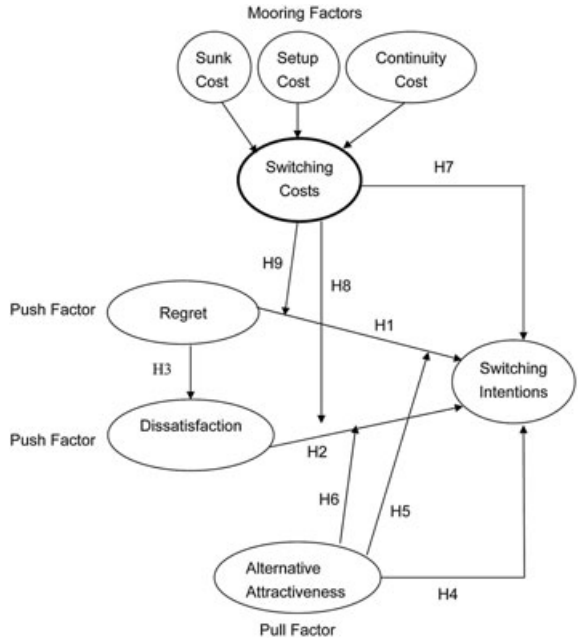

Figure 1. Research model.

relationship between dissatisfaction and switching has been examined in several studies (Zeelenberg & Pieters, 2004Anton *et al*., 2007). Dissatisfied customers are more likely to switch than satisfied ones (e.g., Loveman, 1998). Regret is identified as the other push construct that also influence repurchase/reuse intentions (Liao *et al*., 2011) and is defined as the performance comparison between chosen and forgone alternatives (Tsiros & Mittal, 2000). When consumers experience regret, their intentions for choosing an alternative may intensify, even if they are satisfied with the current service (Liao *et al*., 2011; Tsiros & Mittal, 2000). SNS users could regret their decisions when imagining or realizing that a different choice would have led to a better outcome. Examples of such better outcome include stronger informational privacy control, better feature set, higher system quality, better information/data/network quality, better customer service, and easier to establish relationships with friends. Although the literature is still scarce in the role of regret due to the attention to it started only recently, studying regret and dissatisfaction does have its theoretical backing. Inman *et al*. (1997) show that both regret and dissatisfaction are both viable post-experience constructs that both have an effect on use intention. Therefore, consistent with the literature development, both dissatisfaction and regret are expected to directly influence switching intentions in this study.

H1: Users' regret with a current SNS is positively related to the intention to switch to another SNS provider.

H2: Users' dissatisfaction with a current SNS is positively related to the intention to switch to another SNS provider.

Several studies have shown that regret is an antecedent of consumer dissatisfaction (Inman *et al*., 1997; Taylor, 1997; Tsiros & Mittal, 2000; Zeelenberg & Pieters, 2004; Keaveney *et al*., 2007; Liao *et al*., 2011) It is also associated with reduced repurchase intentions (Inman *et al*., 1997; Zeelenberg & Pieters, 1999) and increased brand switch intentions (Bui *et al*., 2011). Taylor (1997) used non-chosen movies as forgone alternatives and found that regret derived from the expectation gap between the chosen and the non-chosen movies influenced the satisfaction for the chosen alternative. Expectations about unchosen alternatives affect satisfaction with one's choice when that choice does not meet the expectations, but it has little effect when the choice meets expectations (Taylor, 1997). After reviewing the regret, satisfaction, and disappointment literature, Zeelenberg & Pieters (2004) concluded that we knew more about satisfaction when regret is taken into consideration (p. 88), which suggests regret as a possible antecedent of satisfaction. Tsiros (1998) explains that the difference between the two constructs lies in how the reference point is used, but both constructs result from the performance level that is below the reference point. In dissatisfaction, the expectation level that represents the reference point is known and determined from one's own past experience before the chosen alternative is experienced. As a result, regret is related to choice, while dissatisfaction is related to outcomes (Tsiros, 1998, p. 50). Even when expectations are met

that leads to an acceptable level of satisfaction, regret from comparing the obtained performance with the ideal performance will diminish the level of satisfaction (Medvec *et al*., 1995; Bui *et al*., 2011). In summary, expectations as the reference point for dissatisfaction are based on one's past overall experience that is the result from multiple sources of influence, but regret through comparing forgone alternative with the chosen one represent an event that has occurred (see Tsiros, 1998 and others). In other words, regret is likely rooted in the direct experience of forgone and chosen products, which is a more concrete or stronger mental event that may help solidify other forms of perception due to its deeper relevance to the products in question. Therefore, the following hypothesis is postulated on the basis of this line of research.

H3: Users' regret with a current SNS is positively related to the dissatisfaction toward their current SNS.

Pull factor: alternative attractiveness

Pull factors refer to the 'positive factors drawing prospective migrants to the destination' (Moon, 1995) and 'attributes of distant places that make them appealing' (Dorigo & Waldo, 1983). The push-pull paradigm suggests that attractive factors at a destination pull the migrant toward that destination (Bansal *et al*., 2005). Alternative attractiveness is often used as a pull factor in the marketing literature to study the intention to switch to an alternative product (Ping, 1993; Bansal *et al*., 2005). Jones *et al*. (2000) defined alternative attractiveness as 'customer perceptions regarding the extent to which viable competing alternatives are available in the marketplace.' When SNS users face viable alternatives, the high perceived benefits of the alternatives may result in the heightened likelihood of switching intention. Conversely, unattractive alternatives give SNS users no reason to leave their current SNS service provider. Therefore, perceived attractiveness of the alternatives is positively associated with consumers' intentions to switch services (Kim *et al*., 2006; Zhang *et al*., 2009). In the PPM-related studies, alternative attractiveness is also considered one key pull factor to study switching intention (see Cheng *et al*., 2009; Hou *et al*., 2011; Zhang *et al*., 2012). Therefore, the following hypothesis is proposed:

H4: Users' perception of alternative attractiveness is positively related to the intention to switch to another SNS provider.

When attractive alternatives exist, regretful and dissatisfied SNS users will likely switch to the alternatives than those who are non-regretful and satisfied (Jones *et al*., 2000). Conversely, even disgruntled users do not switch SNS service providers when there are no attractive alternatives (Kim *et al*., 2006). Regret and dissatisfaction with an existing SNS service provider may trigger a heightened interest toward switching service providers, but such a motive will likely to translate into reality in the presence of good alternative. Therefore, alternative attractiveness can moderate the effects of regret and dissatisfaction with switching intention:

H5: Weaker perception of alternative attractiveness weakens the relationship between regret and switching intention.

H6: Weaker perception of alternative attractiveness weakens the relationship between dissatisfaction and switching intention.

Mooring factor: switching costs

Boyle *et al*. (1998) indicated that 'any simple comparison between push and pull factors is complicated by the presence of intervening opportunities—obstacles such as family obligations at the origin or the high cost of moving, which may prevent migration occurring.' Therefore, an individual may not migrate, even when push and pull factors are strong because of situational constraints (Lee, 1966). An important mooring factor identified in studies regarding customer switching is the perceived switching costs (Jones *et al*., 2000; Kim *et al*., 2004; Ye & Potter, 2011). Switching costs refer to costs that users must bear when switching from a current service to another (Dess *et al*., 2007). The switching costs associated with moving are deterrents to migration (Lee, 1966; Bansal *et al*., 2005). Numerous marketing studies have examined the concept of switching costs in customer decision making (e.g., Bolton *et al*., 2000; Jones *et al*., 2000). A customer's willingness to switch service providers is reduced with increased switching costs (Bansal *et al*., 2005; Kim *et al*., 2006; Ye *et al*., 2008; Zhang *et al*., 2009).

Switching costs incurred during the switching process can result in the form of expended time and effort, expended money, or a psychological impact (Burnham *et al*., 2003; Ye & Potter, 2011). A minimum of procedural, behavioral, and psychological costs are incurred during the switch of SNS services, even when financial costs may not be involved. These costs include the perception of irrecoverable time and effort that were invested into the current SNS service (sunk cost), the additional time and effort involved in the registration of new SNS accounts and building of new profiles (setup cost), and the considerable time and effort expended for notifying current SNS friends of the move and the building of a new network of friends in the new SNS as well as losing contact with some friends if users move from the current SNS service to another one (continuity cost). Multiple switching costs (sunk, setup, and continuity costs) are related to SNS switching. For example, Cheng *et al*. (2009) considered switching costs (with only setup cost and continuity cost) as the mooring factor, but switching costs failed to have a statistically significant effect on switching intention. Zhang *et al*. (2012) considered sunk cost as the only mooring factor, which was the second largest factor in PPM to predict switching intention. Taken it as a whole, three key forms of switching costs (sunk, setup and continuity) as the mooring factor could have an effect on switching intention (Jones *et al*., 2000; Bansal *et al*., 2005; Cheng *et al*., 2009; Ye & Potter, 2011):

H7: Users' perceptions of switching costs for switching are negatively related to the intention to switch to another SNS provider.

The migration literature shows that mooring factors can moderate the relationships between the push and pull factors (Lee, 1966). The perceived benefit of switching resulting from dissatisfaction with the current service may be less than the perceived cost of switching when the perceived switching costs increase. According to the PPM model, a customer has a high probability of remaining with the current service provider when mooring factors are strong, even if push and pull factors are also strong (Boyle *et al*., 1998: Bansal *et al*., 2005). When customers are regretful or dissatisfied with their current service provider, they may still be reluctant to switch due to a high level of switching costs. SNS users may remain, despite their regret or dissatisfaction because of their perception that switching costs outweigh switching benefits. Therefore, switching costs are postulated to moderate the relationships of regret and dissatisfaction with switching intention as follows:

H8: Stronger perceptions of switching costs weaken the relationship between dissatisfaction and switching intention.

H9: Stronger perceptions of switching costs weaken the relationship between regret and switching intention.

RESEARCH METHODOLOGY

Measurement

We derived the questionnaire in the research model from previous studies (See Appendix). A pretest of the survey was implemented by two researchers in the field to improve the face validity of the instrument. Forty undergraduate students participated in the pilot study before the instrument was fully launched in the target population. The result of the pilot study showed that Cronbach's α value of each construct exceeded the standard of 0.828, confirming its acceptability (Nunnally, 1978). All items in the questionnaires adopted a 7-point Likert scale ranging from 1 (*strong disagreement*) to 7 (*strong agreement*). The scale items for sunk, setup, and continuity costs were adapted from the Jones *et al*. (2002) and Kim *et al*. (2006) studies, the alternative attractiveness instrument was adapted from the Jones *et al*. (2000) study, and the scale items for regret and dissatisfaction were adapted from the Tsiros & Mittal (2000) and Bhattacherjee (2001) studies. Furthermore, the scale for switching intention was adapted from the Kim *et al*. (2006) study. The operational definitions of the constructs are shown in Table 1.

Data collection

Empirical data were collected by conducting a field survey of SNS users. Accounts were created for Facebook, MySpace, and MSN Space, and invitations to participate in the survey were posted in public groups and forums. The three largest social networking sites, Facebook,

Table 1. Operational definition of constructs

Construct	Operational definition	Source
Sunk cost	Non-recoverable time and effort already spent on the current SNS.	Jones *et al*. (2002)
Setup cost	SNS users need to spend additional time and effort when signing up new SNS accounts and building a new profile.	Kim *et al*. (2006)
Continuity cost	SNS users need to exert considerable effort in order to stay on the current SNS.	Kim *et al*. (2006)
Alternative attractiveness	An alternative SNS is perceived as being better.	Jones *et al*. (2000)
Regret	A negative emotion that SNS users experience when an alternative SNS turns out to be, or is imagined to be, a better choice than the current alternative	Tsiros & Mittal (2000)
Dissatisfaction	SNS users' affect with (feelings about) current SNS use.	Bhattacherjee (2001)
Switch intention	SNS users' intention to switching to an alternative SNS.	Kim *et al*. (2006)

SNS, social networking site.

MySpace, and MSNSpace were selected because they are very popular and have large number of users. A total of 237 questionnaires were returned, with 218 questionnaires being regarded as valid after eliminating duplicate copies, copies with missing values, or other invalid copies. Table 2 shows the demographic distribution of the sample. The sample comprised 46.8% male and 53.2% female respondents. In total, 24.8% respondents were below the age of 20 years, 66.9% of respondents were between the ages of 20 and 40 years, and 8.3% of respondents were above the age of 40 years. For occupational demographics, the category of 'student' accounted for 46.3% of all respondents, which was the largest group to SNS users. Most respondents (67.4%) had 5 or more years of internet experience, 27.1% of respondents had 3 years or less SNS experience, 72.9% had more than 3 years of SNS experience, and 40.4% of respondents had between 3 and 5 years of SNS experience. A chi-square test was conducted for gender, age, and occupation to examine group differences among these variables for their effects on SNSs. The results show that there is no significant difference for gender ($p = 0.415$), age ($p = 0.356$), and occupation ($p = 0.438$). Thus, differences among SNSs users in the sample do not seem to cause a significant concern.

Harman's one-factor test (Harman, 1967) has been conducted to study the effect of common method variance. The result of principal components factor analysis shows seven factors, each with an eigenvalue greater than one. There is no single factor that accounts for the majority of the variance. Therefore, common method bias is not an alarming concern because the largest variance explained by one factor is only 30.118%.

Statistical analysis technique

Structural equation modeling (SEM) is a multivariate statistical analysis technique (Hair *et al*., 1998). SEM consists of two types of models: the measurement model and the structural model. The measurement model defines the constructs the model uses and assigns observed items to each construct. Thereafter, the structural model defines the causal relationship among these constructs (Gefen *et al*., 2000). The use of SEM tools is becoming increasingly common in psychological and social and behavioral science research for the causal modeling of complex

Table 2. Demographics of respondents

Demographics	Category	Frequency	Percentage
Gender	Male	102	46.8
	Female	116	53.2
Age	<20	54	24.8
	21–29	101	46.3
	30–39	45	20.6
	>40	18	8.3
Occupation	Student	101	46.3
	Soldier/official/teacher	36	16.5
	Business/industry	27	12.4
	House keeper/not employed	24	11.0
	Others	30	13.8
Internet experience(Year)	<1	12	5.5
	1–3 years	25	11.5
	3–5 years	34	15.6
	5–7 years	46	21.1
	>7 years	101	46.3
Using SNS experience (Year)	<1	27	12.4
	1n3 years	32	14.7
	3–5 years	88	40.4
	5–7 years	41	18.8
	>7 years	30	13.8

SNS, social networking site.

and multivariate data sets in which researchers gather multiple measures of proposed factors (Hair *et al*., 1998). This study examines the causal relationships between latent variables by using the SEM technique. A two-stage analysis method is implemented for data analysis: the measurement model and structural model.

Partial least squares (PLS) is a SEM technique that can accommodate the presence of a significant number of variables, relationships, and moderating effects (Pavlou *et al*., 2007). The PLS technique is best suited for complex models because it has minimal restrictions on measurement scales, sample sizes, and residual distributions (Chin *et al*., 2003). This study uses the PLS method of SEM (SmartPLS) to conduct data analysis because the PLS method can handle formative constructs and highly complex predictive models.

DATA ANALYSIS AND RESULTS

Measurement model

Confirmatory factor analysis was conducted to test the measurement model. The acceptability of the measurement model was assessed by the reliability of individual items, internal consistency between items, and the model's convergent and discriminant validity. Table 3 shows information regarding the number of items, mean, standard deviation, composite reliability, average variance extracted (AVE), square root of the AVE, and the correlations between the constructs.

Table 3. Descriptive statistics and reliability

No.	Construct	No. of items	Mean (SD)	Composite reliability	AVE	Correlations						
						1	2	3	4	5	6	7
1	Sunk cost	5	4.12 (1.25)	0.86	0.82	0.91						
2	Setup cost	3	5.08 (1.07)	0.85	0.91	0.46	0.95					
3	Continuity cost	3	5.13 (1.02)	0.87	0.92	0.46	0.58	0.96				
4	Alternative attractiveness	4	3.06 (1.15)	0.94	0.80	0.21	0.25	0.26	0.90			
5	Regret	3	2.16 (1.06)	0.93	0.86	−0.31	−0.35	−0.33	0.36	0.93		
6	Dissatisfaction	4	2.84 (1.14)	0.96	0.88	0.37	0.31	0.32	0.35	0.52	0.94	
7	Switch intention	3	2.27 (1.08)	0.95	0.90	−0.58	−0.56	−0.57	0.58	0.59	0.50	0.95

Note: Diagonals represent the square root of the average variance extracted, while the other matrix entries represent the correlations.
SD, standard deviation; AVE, average variance extracted.

The composite reliability measures were all greater than 0.85, which is above the recommended 0.70, indicating that the internal consistency is adequate (Bagozzi & Yi, 1988). Convergent validity is demonstrated because the AVE values for all constructs were above the suggested threshold value of 0.50 (Fornell & Larcker, 1981). Discriminant validity is confirmed when the square root of each construct's AVE is larger than its correlations with other constructs (Fornell & Larcker, 1981). The square root of the AVE is significantly larger than its correlations with other constructs; thus, discriminant validity was achieved (Table 3).

Structural model assessment and hypotheses testing

The standardized PLS path coefficients for testing the structural model are shown in Figure 2. The findings support all hypotheses (H1 to H9) and indicate that the push factor *regret* with the current SNS, push factor *dissatisfaction* with the current SNS, and pull factor from the alternative SNSs all have important positive roles in users' decisions regarding SNS switching. Moreover, the push factor *regret* with the current SNS has a significant positive effect on the push factor *dissatisfaction* with the current SNS; thus, H1 to H4 were supported. The results show that the push factor *regret* with the current SNS is the most important antecedent of switching intentions. The results suggested that the pull factor *attraction* from alternative SNSs positively moderates the relationship between the push factor *regret* with the current SNS and switching intentions. Moreover, the pull factor *attraction* from the alternative SNSs positively moderates the relationship between the push factor *dissatisfaction* with the current SNS and switching

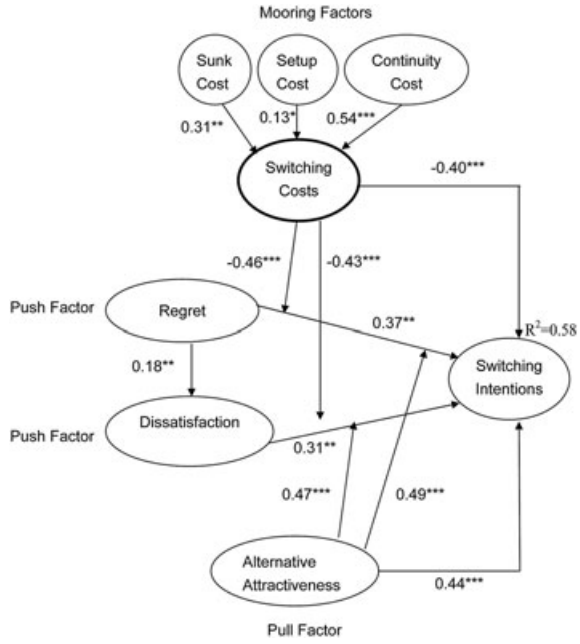

Figure 2. Results of PLS analysis.

intentions; thus, H5 and H6 were supported. However, the mooring factor (switching costs) is negatively associated with switching intentions. Therefore, H7 was supported. When the strengths of the main effects are compared on the basis of standardized coefficients, continuity cost showed the highest influence, followed by sunk and setup costs. Continuity cost is the most prominent factor that influences a user's intention to switch to another SNS service. Moreover, the mooring factor (switching costs) negatively moderates the relationship between regret and switching intentions. Moreover, the mooring factor (switching costs) negatively moderates the relationship between dissatisfaction and switching intentions; thus, H8 and H9 were supported. These constructs explained 58% of the variance of switching intentions.

DISCUSSION AND IMPLICATIONS

The primary objective of this study is to evaluate the factors that affect the switching intention of SNS users based on the PPM framework of migration theory. All push (dissatisfaction and regret), pull (attractive alternatives), and mooring (switching costs) factors are shown to be imperative in SNS users' switching intentions. These findings elucidate the switching behavior of SNS users and provide several managerial implications for both researchers and practitioners. The satisfaction/dissatisfaction construct has been extensively studied (e.g., Oliver, 1997; Bhattacherjee, 2001; DeLone & McLean, 2003; Chiu *et al*., 2007; Wang, 2008). Studies on the effect of regret are still rare, despite that the literature (e.g., Inman *et al*., 1997) has consistently shown that the two constructs are both viable post-experience constructs and are different from each other. Regret is a relatively new construct in the social networking literature and has a more important role than other antecedents (e.g., satisfaction, past use, and perceived usefulness) on users' intention for the continuation of a service (Kang *et al*., 2009). Conceptualizing this construct and validating its consequences in SNS services are important contributions of this study. To the best of our knowledge, this is one of the first studies that specifically addresses regret in the online social networking context.

Our findings show that regret has a direct influence on switching intention and an indirect influence through dissatisfaction. The direct effect (0.37) is a lot stronger than its indirect effect ($0.18 * 0.31 = 0.056$), but slightly stronger than the direct effect of dissatisfaction (0.31) on switching intention. This shows that both regret and dissatisfaction have a fairly equal effect on switching intention. Because regret is related to choice and dissatisfaction is related to outcomes (Tsiros, 1998), it is useful for practitioners to experiment with techniques to affect these perceptions through their offerings. For example, a new SNS with a feature set that covers those of the competitors and at the same time offer their own unique capabilities are likely to reduce regret and possibly dissatisfaction.

The strong relationships between attractive alternatives and switching intentions, and between the switching costs and switching intentions demonstrate the vital roles in SNS service switching. This suggests that the availability of attractive alternatives and switching costs have a significant effect on the switching intention of SNS users. The PPM model recognizes the moderation role of mooring effects (Moon, 1995; Bansal *et al*., 2005) which was also modeled in our work. An interesting finding of the role of switching cost is that its direct effect on switching

intention (−0.40) was as strong as its indirect effects (−0.46 for regret-switching and −0.43 for dissatisfaction-switching). The negative path coefficient of the direct effect shows that low switching cost makes it less difficult to switch (or high switching cost makes it more difficult). The negative path coefficients of the moderation effects show that SNS users with a high level of regret or dissatisfaction have a lower level of intention to switch when they perceive that the economic and psychological costs of switching to a new SNS are too high. SNS users who are already satisfied or do not regret their choice of the existing SNS may not switch under significant switching costs. Of the three second-order factors for switching costs, continuity cost is the most dominant force (0.54), followed by sunk cost (0.31) and setup cost (0.13). Because continuity cost refers to the lost performance when switching to a new service provider and are frequently measured before the switch, it is crucial for new SNSs to spend effort on instilling the believe that the potential users have nothing (or not much) to lose when they switch. Many businesses have used product demos, guided tours, screenshots, or feature comparison with the existing vendors as a way to promote the idea that features of current products are supported in the new product. It is important to know that it is the innovative and useful features in the new products that give users a reason to switch. The statistically significant sunk cost can be a way for existing service providers to retain their users, but it is a double-edged sword that also offers new vendors an opportunity to 'import' content from existing servicers. This already happens in desktop or mobile applications. For example, many major project management programs already have the capability to import projects build with Microsoft Project. In the SNS environment, direct import is quite difficult, but existing site scraping, content extraction and screen capturing technologies are some promising techniques for a possible content transfer between SNSs.

The moderating effects of attractive alternatives (pull factor) on the relationship between regret and switching intention, and between dissatisfaction and switching intention are highly significant. As with the switching costs whose direct and indirect effects are fairly similar in magnitude, there is only a very slight amount of difference between the direct effect (0.44) and indirect effects (0.49 and 0.47) of alternative attractiveness. Not only alternative attractiveness influences the intention to switch, it also fuels the relationships between regret and dissatisfaction with switching intention. The lack of attractive alternatives may compel users to remain, even when they are regretful and dissatisfied with their current SNS service (Sharma & Patterson, 2000). When SNS users are regretful and dissatisfied with their current SNS service, the availability of viable alternatives can further motivate them to switch providers; thus, SNS providers should be vigilant in their competitor's ability to replace their core capabilities. Both horizontal expansion of innovative features and vertical depths of capabilities will likely diminish the attractiveness of competing products and make it more difficult to imitate in the short-run.

The PPM framework provides a useful tool for assisting SNS providers in mapping the competing forces that influence the movements of their SNS user base, which include factors that push SNS users away, pull SNS users toward competitors, and facilitate or inhibit switching (Cheng *et al*., 2009). Our work shows that switching intention is influenced less by users' evaluations of SNS providers' characteristics and service experience (push factors) than the alternative attractiveness (pull factors) and switching costs (mooring factors). We also highlight

significant factors for retaining registered SNS users, minimizing the service switching of SNS users, and attracting new members. Examining how PPM factors impact the switching decisions is beneficial for SNS providers, because focusing on a subset of it could easily lead to a possibility for bias. For example, simply knowing that the push factors lead to switch intention does not offer enough of insights to explain why people may still not switch despite a high level of regret or dissatisfaction. By taking all three categories of the factors, we are able to see the interwoven relationships among them and with the switching intention. Although our work is one of the early works on PPM in SNS, further studies may expand on our findings by exploring other factors that fit to the PPM framework and possibly offer a cross-sectional or longitudinal observation of the holistic effect of PPM.

This study empirically examines the applicability of the PPM paradigm to SNS switching intentions that contributes to the IS literature in several ways. First, the PPM model highlights the importance of PPM variables as the drivers of human migration; these switching predictors have not received much attention in the IS literature to predict SNS switching behavior. Coupled with the lack of a comprehensive framework to model SNS switching behavior in general, our work was designed to fill these gaps. Second, our findings support the general conception of the migration theory, which in itself provides empirical generalizability of the migration theory to social networks. In other words, not only the analogy of 'migration' is applicable for software, we provide an empirical support for it as well. Third, although several studies (e.g., Cheng *et al*., 2009; Zhang *et al*., 2012) have applied the PPM model to explain online migration behavior, this is the initial study that combines PPM and regret theory in the context of SNS. As we discussed previously, there is very scarce empirical evidence of regret in social networking despite the fact that literature suggests both regret and satisfaction may run in parallel in the post-use experience. Our work provides some basic evidence for both constructs. Fourth, we are able to also uncover both direct and indirect effects of the pull and mooring factors. This helps fill the gap to explain why switching does not necessarily happen even when the users are dissatisfied and/or regretful about their existing SNS. The strong moderation effects of both pull and mooring factors provide key directions for SNS vendors to engage their existing users as well as attract from others. Finally, this study considers how the PPM model and regret theory can be used to suggest new predictors of switching intention. The findings offer academic implications for related studies and practical implications for SNS providers.

LIMITATIONS

Our work is no different from other studies in that limitations are still possible despite a carefully designed plan is executed with prudence. First, we focused on regret and dissatisfaction as the two push factors for their joint effect on switching intention under the influence of various forms of pull and mooring factors. Although this works well for our intended purpose and context of study, it is important to point out that such effect may not be as strong in different contexts (e.g., online banking). In this latter case, researchers are advised to explore push factors most relevant to their study context. Second, our dependent variable is constructed to measure switching intention, but it is useful to note that switching in the SNS context does not always

imply a complete termination of the previous SNS service. An intention to switch drives a user toward the new service, which can be a gradual process depending on the past investment of time, effort, and material on the existing service. Therefore, it is possible for a user to be on multiple SNSs during this transition period. Third, because of the reason that abrupt discontinuation of an existing SNS service may be rare, our dependent variable measures intention rather than action. Because this is a variable that measures self-reported intention, readers are cautioned not to generalize it as an assurance of the actual behavior to switch.

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APPENDIX
MEASUREMENT ITEMS

Regret (REG)

REG 1: I feel sorry about choosing this SNS service.
REG 2: I regret choosing this SNS service.
REG 3: I should have chosen another SNS service.

Dissatisfaction (DIS)

DIS 1: I feel satisfied about my overall experience using this SNS service.
DIS 2: I feel pleased about my overall experience using this SNS service.
DIS 3: I feel contented about my overall experience using this SNS service.
DIS 4: I feel delighted about my overall experience using this SNS service.

Sunk cost (SUC)

SUC 1:A lot of energy, time, and effort has gone into using this SNS service.
SUC 2:Overall, I have invested a lot into using this SNS service.
SUC 3:All things considered, I have put a lot into previous use of this SNS service.

SUC 4:I have spent a lot of time and effort on this SNS service.

SUC 5:I have invested a lot into using this SNS service.

Setup cost (SEC)

SEC 1:Building a new profile in an SNS service takes up too much time and effort.

SEC 2:Entering required information to join a new SNS service is annoying.

SEC 3:Signing up for a new SNS service is inconvenient.

Continuity cost (COC)

COC 1:It takes too much time and effort to notify my friends about my movement to a new SNS service.

COC 2:I may lose contact with some friends if I move from my current SNS service to another one.

COC 3:It is difficult to build a new network of friends in a new SNS service.

Alternative attractiveness (ALA)

ALA1:Many of my friends recommend the other good SNS to me.

ALA2:My friends have sent me invitations from the other good SNS.

ALA3:If I need to change SNSs, there are other good SNSs to choose from.

ALA4:Compared to this SNS, there are other SNSs with which I would probably be equally or more satisfied.

Switching intention (SWI)

SWI1:I am considering switching from my current SNS service.

SWI2:The chance of my switching to another SNS service is high.

SWI3:I am determined to switch to another SNS service.