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# The Effects of Privacy Concern and Social Influence on User Acceptance of Online Social Networks

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## ABSTRACT

With the proliferation of online social networks, understanding how and why individuals adopt and use online social networks can help managers and marketers to design better methods and approaches towards engaging users of these kinds of networks. The purpose of this study is to investigate the determinants of user acceptance of online social networks, with particular attention given to a research model incorporating the variables of privacy concern and social influence into the Technology Acceptance Model (TAM). The enhanced model, tailored to the unique characteristics of online social networks, will be tested via a survey study.

## Keywords

Technology acceptance; TAM; Online social networks; Privacy concern; Social influence; Perceived usefulness; Perceived ease of use

## INTRODUCTION

In recent years there has been a rapid increase in user participation in online social networks (e.g. Facebook, MySpace), and in the commercial value of these sites. According to the Facebook website (<http://www.facebook.com/press/info.php?statistics>), in February 2009, there were more than 150 million active users (with 120 friends for an average user), and over 3 billion aggregated minutes spent on Facebook every day. Understanding how and why individuals adopt social networks can provide valuable insights for the managers and marketers of online social network sites.

The Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) is a well-researched and empirically validated model which has been successful in predicting behavior in a variety of domains. This general model was further adapted into the Technology Acceptance Model (TAM) (Davis, 1989) specifically for predicting the usage behavior of information systems. Venkatesh and Davis (2000) further extended TAM into TAM2 by incorporating the effects of other significant variables such as social influence. These theories and relevant empirical studies are the underpinnings of our investigation of usage behavior in the context of online social networks. The applicability of TAM and TAM2 into online social networks is justified by the fact that online social networks are technology-driven.

Online social networks represent a technology-driven platform with characteristics different from most previously studied technologies such as word processors, spreadsheets, and other business software, which are typically used in organizational settings. Online social networks have two distinct characteristics: first, participants of online social networks need to broadcast both their private information and their social network publicly, generally with little control over how this information may be used. As a result, concerns over privacy have received significant public attention (Solove, 2008). Second, rather than being personal and individual, online social networks typically exhibit and experience a high degree of interaction and communication among users. By interacting with other users in online social networks, an individual's usage behavior can be influenced or changed, peer pressure can be exerted, and other impacts due to social influences, can occur. (Marwell, Oliver and Prah, 1988; Govani and Pashley, 2005). A prior study by Im, Kim and Han (2008) indicated that technology type can influence usage behavior. Therefore, studying the usage behavior of online social networks as an emerging technology requires a look at the types and characteristics of the technology, which may alter user acceptance.

The main objective of this research is to develop and empirically validate a TAM-based model to predict the user acceptance of online social networks, especially by integrating the effects of privacy concerns and social influence.

## THEORETICAL FOUNDATIONS AND RESEARCH FRAMEWORK

### Technology Acceptance Model (TAM)

The TAM model theorizes that user acceptance of IT/IS is determined by two beliefs: perceived usefulness (PU) and perceived ease of use (PEOU). In TAM, perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his/her job performance” and perceived ease of use refers to “the degree to which the prospective user expects the target system to be free of effort” (Davis, 1989). Although many companies have started to build in-house social networks to help facilitate communication and knowledge sharing within or even across organizations (Green, 2007), our study focuses on the individual adoption of online social networks for personal purposes in a non-organizational and volitional context. Therefore, we define perceived usefulness (PU) as “the degree to which a person believes that using a particular online social network would help him/her network with others.” Many empirical studies have consistently supported TAM by explaining patterns and variances in technology usage intentions and behavior. Considering that many users have now adopted online social networks, we consider usage behavior (UB) to be a combination of actual use of (measured by self-reported current usage), and the intention to use (measured by self-predicted future usage) online social networks. Users of online social networks interact with social network websites, which are enabled by Internet technologies. Therefore, it is appropriate to consider the variables in TAM in predicting the user acceptance of online social networks. Our choice of TAM over Innovation Diffusion Theory (IDT) (Rogers, 1995; Moore and Benbasat, 1991) when studying individual technology acceptance is due to the fact that while IDT has a number of some relevant constructs (e.g. ease of use) in common with TAM, some of the other constructs in IDT (e.g. voluntariness) are not directly related to our context.

Since TAM is used as the baseline model, the variables of perceived usefulness and perceived ease of use in TAM are posited as the key drivers of user acceptance, and perceived ease of use is an antecedent to perceived usefulness. We will verify them in the context of online social networks:

- H1: Perceived usefulness (PU) has a positive influence on the usage behavior (UB) of online social networks.
- H2: Perceived ease of use (PEOU) has a positive influence on the usage behavior (UB) of online social networks.
- H3: Perceived ease of use (PEOU) has a positive influence on the perceived usefulness (PU).

### Privacy Concern in Online Social Networks

#### *Privacy concern as an attitude toward behavior*

Based on the Theory of Reasoned Action (TRA), an attitude toward behavior is a major determinant of behavior. This attitude toward behavior is determined by beliefs about the consequences of the behavior, and the individual’s subjective evaluation of the probability that performing the behavior will result in the expected consequence (Fishbein and Ajzen, 1975). It suggests that individuals evaluate the possible outcomes before making a decision on whether to get involved in a behavior, and form positive or negative attitudes toward the behavior, which in turn further determine their behavior. Perceived usefulness and perceived ease of use are beliefs theorized in TAM, which is considered as a special case of TRA.

We define privacy concern (PC) as the degree to which a user believes using a system would result in a loss of control over their personal information. While privacy concern (PC) is not specifically included in TRA, the fact that behavioral beliefs affect behavior suggests that PC can be a viable construct related to the principles of TRA. As such, it can play an important role in predicting usage behavior of online social networks. User profiles in social network sites such as Facebook and MySpace are often personally identified. For example, Facebook requires a college email account for entering the social network of that college, and using online social networks typically requires users to reveal their real identity and personal information. The concern is that users have limited control over how their information is used by online social network service providers. For instance, in 2007, Facebook launched the Beacon program which automatically broadcasts users’ purchases from Facebook partners to their Facebook friends without explicit user consent. Over 50,000 Facebook members protested this program as an invasion of privacy and their complaints finally forced Facebook to modify the program (Holahan, 2007). This real world Facebook case suggests that many users are concerned about loss of their privacy as a consequence of using online social networks. From the behavioral perspective, it logically follows that an individuals’ privacy concern creates negative attitudes toward online social networks, which influences their usage behavior.

#### *Privacy concern as a type of perceived risk*

The importance of privacy concern is supported by the literature on user acceptance of Internet-based technologies. In prior studies on user acceptance of online banking (Lee, Lee and Kim, 2007), electronic bill payments (Featherman and Pavlou, 2002) and electronic commerce (Pavlou, 2003), perceived risk was examined in their research models, and privacy risk was identified as one of the factors for perceived risk. Featherman and Pavlou defined “privacy risk” as “potential loss of control over personal information, such as when information about you is used without your knowledge or permission,” which is consistent with our definition of privacy concern. Their studies also indicate, as perceived risk decreases, a user’s willingness to use the system increases.

A convergence of the literature on privacy concern as an attitude toward behavior and a type of perceived risk leads to:

H4: Privacy concern (PC) has a negative influence on the usage behavior (UB) of online social networks.

#### *Interaction between privacy concern and age*

The exploratory study by Acquisti and Gross (2006) found that age is among the most significant factors in determining Facebook membership, and that privacy concerns play a role only for the non-undergraduate (older) population, thus providing evidence for the following hypothesis:

H5: The influence of privacy concern (PC) on usage behavior (UB) of online social networks is stronger for older users.

#### *Interaction between privacy concern and gender*

The literature on privacy indicates that women are more concerned than men both about their privacy in general (Friedman, Kahn, Hagman and Severson, 2006) and for their Internet privacy (Sheehan, 1999). Not surprisingly, a report from Pew Internet & American Life Project (<http://www.pewinternet.org/>) showed that teen girls were more concerned than boys about releasing any information which may be linked to one’s physical location (Lenhart and Madden, 2007). Garbarino and Strahilevitz (2004) found that the consequences of a loss of privacy were perceived as substantially more serious for women than for men. Prior research also demonstrated that women are found to be more risk averse than men (Byrnes, Miller and Schafer, 1999) and that female subjects exhibited a higher level of self-regulatory efficacy than males for the protection of personal private information (Kuo, Lin and Hsu, 2007).

H6: The influence of privacy concern (PC) on usage behavior (UB) of online social networks is stronger for female users.

### **Social Influence and Online Social Networks**

#### *Social Learning Theory and Conflict Elaboration Theory*

Social influence occurs when an individual’s behavior is influenced by those around him/her, and social psychology theories support the importance of social influence in determining behavior. Social Learning Theory (Bandura, 1977) indicates that people learn from one another through communications with their trusted friends. The Conflict Elaboration Theory of Social Influence (Mugny, Butera, Sanchez-Mazas and Perez, 1995) further suggests that, when an individual decides whether to adopt or reject an innovation, the effects of the decision upon the individual’s relationship with others in the group are considered. As a result, conformity to the majority occurs. Davis, Bagozzi and Warshaw (1989) indicated that social influences can affect behavior through perceived usefulness, via the theoretical mechanisms of internalization and identification. Among the mechanisms identified by Kelman (1958), internalization occurs when a user accepts others’ belief as evidence of reality, and identification occurs when a user adopts a belief to establish or maintain his/her relationship to the group.

By comparing TRA and TAM, Davis et al. (1989) found that social influence in TRA is a weak predictor of technology usage behavior. They suggested that it was possibly due to the fact that “the specific application studied, word processing, is fairly personal and individual, and may be driven less by social influences compared to more multi-person applications.” They also pointed out that further research is needed “to better understand the nature of social influences, and to investigate conditions and mechanisms governing the impact of social influences on usage behavior.” Since social networks are socially anchored rather than being “personal and individual,” they are naturally expected to be more driven by social influences.

The survey results by Govani and Pashley (2005) indicate two reasons why users join Facebook: “joining due to friend recommendations and peer pressure”, and the other being the “usefulness of Facebook in meeting new people, keeping in

touch, getting help in courses, finding old friends, and making new friends.” These results provide empirical support that social influence can be a viable construct in the extended TAM model to predict the usage behavior of online social networks.

#### *The role of subjective norm in TRA and TAM2*

According to TRA, subjective norm as a form of social influence is a core determinant to behavior. Subjective norm (SN) is defined as “person's perception that most people who are important to him think he should or should not perform the behavior in question.” Social influence is not considered in TAM. As an extension of TAM, TAM2 incorporates the effects of social influence such as subjective norm on technology acceptance (Venkatesh and Davis, 2000). Specifically, according to TAM2, social influence has a direct effect upon usage behavior in mandatory use, but not in voluntary use; social influence has a direct effect upon perceived usefulness whether the system use is mandatory or voluntary; the effect of social influence upon usage behavior is mediated by user experience. In the context of our study, the use of online social networks is typically voluntary. Therefore, we expect that subjective norm would have a direct effect upon perceived usefulness.

#### *A critical mass of online social networks*

According to Metcalfe's Law, the value of a network grows by the rate of the square of its user base number. In online social networks, users participate by linking with their friends to form a social network, by sharing information, and by communicating with their friends. Using network theory, the value of an online social network to a user increases when more users are involved in the network. Rogers (1995) defined critical mass as the point at which a minimum number of users have adopted an innovation so that its further adoption becomes sustaining. According to Markus (1994), an individual will not adopt an interactive medium such as Instant Messaging unless other recipients also use the same medium. As a form of social influence, a critical mass is reached when sufficient initial adopters create sufficient momentum which fuels rapid and widespread adoption by others (Oliver, Marwell and Teixeira, 1985). In particular, the density of social ties in social networks improves the prospect for critical mass (Marwell et al., 1988). When a user has more friends (social ties) using online social networks, the user will perceive the system to be of higher value and therefore would be more motivated to use it.

Drawing upon the theories and evidences from social psychology, technology acceptance, and economics, the following hypotheses are proposed:

H7a: Social influence (SI)-Subjective norm (SN) has a positive influence on perceived usefulness (PU) of online social networks.

H7b: Social influence (SI)-Critical mass (CM) has a positive influence on perceived usefulness (PU) of online social networks.

### **Research Model**

We expect that combining the beliefs of TRA, TAM and TAM2 will yield a better perspective on the determinants of the user acceptance of online social networks. It should be noted that additional constructs were added to enhance this integrated model, which is focused specifically towards online social networks. Figure 1 shows our research model.

### **RESEARCH METHOD**

The survey method is a typical approach for testing models in IS research (Galliers, 1992; Pinsonneault and Kraemer, 1993). Pinsonneault and Kraemer (1993) suggested that survey research is especially appropriate for explanatory models where the phenomena must be studied in natural settings and when the phenomena of interest occur in the recent past. A cross-sectional survey study will be employed to collect data in order to test the research model outlined above.

Development of the questionnaire items to measure each of the constructs in the research model (Figure 1) will proceed through a series of steps. When available, measurements items will be adapted from prior studies. For instance, items to measure perceived usefulness (PU), perceived ease of use (PEOU), and subjective norm (SN) will be developed based on the work of Davis and his colleagues (Davis et al., 1989, Venkatesh and Davis, 2000). Items to measure privacy concern (PC) will be based on the work in Featherman and Pavlou (2002) and Acquisti and Gross (2006), items to measure critical mass (CM) will be developed based on the work by Hsu and Lu (2003) and Slyke, Llie, Lou and Stafford (2007).

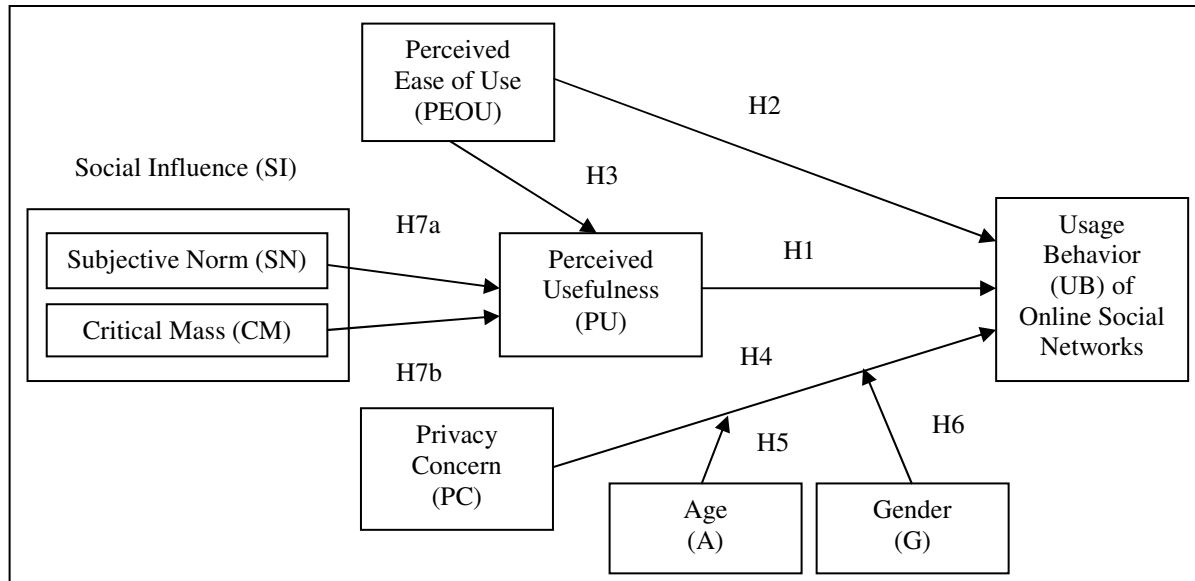


Figure 1. Acceptance model of online social networks

A pilot study will be used to ensure that the survey items are relevant in the context of online social networks, and their face validity. Based on the feedback from the pilot study, refinements will be made to the questionnaire items. The finalized survey questionnaire will be distributed to a sample of online social network users. The survey also collects subjects' demographic information, such as age and gender. For usage behavior, we plan to measure the frequency and degree for both self-reported current usage and self-predicted future usage.

After the data have been collected, we will perform confirmatory factor analysis to examine the reliability and validity of the measurement items. Then we will test the research model using Structured Equation Modeling (SEM). SEM has been widely used in IS research to validate instruments and test linkages between constructs (Chin, 1998; Gefen, Straub and Boudreau, 2000). Findings will be reported after the data analysis. We will discuss the results with regard to the implications for research and practice in the field of online social networks.

## EXPECTED CONTRIBUTIONS

Our research model takes into account the unique characteristics of online social networks. A few variables, namely subjective norms, critical mass, and privacy concerns, are added into the traditional TAM model to enhance the explanatory power of our research model. In addition, this study hypothesized the moderating role of age and gender in the relationship between privacy concerns on usage behavior in online social networks. This provides a more comprehensive understanding on privacy issues.

Aside from the theoretical value, our research results would have great practical value. The findings may provide developers with guidelines for developing new information systems, especially online communities with similar characteristics to social network sites. Managers of online social networks can gain insights on proactively designing interventions to engage people who are less inclined to use online social networks. Our research findings will also allow marketers to make better informed decisions on their marketing strategies in online social networks.

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