

8-5-2011

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## Recommended Citation

Jung, Eun Ju; McKnight, D. Harrison; Jung, Euisung; and Lankton, Nancy K., "The Surprising Lack of Effect of Privacy Concerns on Intention to Use Online Social Networks" (2011). *AMCIS 2011 Proceedings - All Submissions*. 285.

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# The Surprising Lack of Effect of Privacy Concerns on Intention to Use Online Social Networks

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## ABSTRACT

The number of users of Online Social Networks (OSNs) has increased dramatically. To join OSNs, users need to disclose their information to others. If people have higher levels of privacy concerns, they may hesitate to expose their information. Therefore, privacy concerns should be an important factor affecting the use of OSNs. Based on prior studies, we investigate how individuals' perceived benefits (usefulness, playfulness) and perceived costs (privacy concern) directly influence their intention to continue using OSNs, and how the benefits are mediated by cost factors in cognitive cost-benefit calculations. We suggest five hypotheses and examine them empirically with 391 survey responses. The results only support the direct effect of perceived benefits on OSNs. Results do not show any direct effect or mediation effect of privacy concerns on the intention to use OSNs. This paper contributes to future social network studies by providing a conceptual framework as well as empirical results.

## Keywords

Online Social Network, Privacy concern, Perceived Usefulness, Playfulness, Information System Use

## INTRODUCTION

The number of users of Online Social Networks (OSNs) such as Facebook, Twitter and MySpace has dramatically increased. According to 2010 Morgan Stanley Research, the total number of unique users of global social networking web sites is 859 million, with a yearly increase rate of thirty-two percent ([http://www.morganstanley.com/institutional/techresearch/pdfs/Internet\\_Trends\\_041210.pdf](http://www.morganstanley.com/institutional/techresearch/pdfs/Internet_Trends_041210.pdf)). By 2011, Facebook was reported to have more than 500 million active users (<http://www.facebook.com/press/info.php?statistics>).

It might be more difficult to know why people use OSNs than to learn how to use OSNs. Therefore, it is interesting to study which factors enhance or impede an individual's use of OSNs. Some people may use OSNs for hedonic purposes and others for utilitarian purposes, or both. Privacy has been a critical issue in OSNs use because people need to disclose their personal information and share them with others who are connected with them, or even those who are not connected, in order to join and use OSNs. Since the privacy issues might diminish the value of OSNs, OSN providers have continually tried to improve their privacy policy and settings. However, prior related studies do not pay much attention to how the cognitive calculation of the benefits from enhancing factors and the perceived cost from the impeding factor affect the users' continued use of OSNs. Privacy concerns are the single most frequently cited reason by non-internet users for declining to use the internet (Westin 2003). Prior studies of privacy issues in the internet adoption show that individuals will disclose personal information if they perceive that the overall benefits of disclosure are at least balanced by the assessed risk of disclosure (Culnan and Bies, 2003; Dinev and Hart, 2006). In this paper, we investigate whether this cognitive calculation affects OSNs use in that once people perceive positive net benefits they are more likely to accept the loss or risk which accompanies the benefits.

We research the following questions:

- (1) Which factors influence continuous use of OSNs?
- (2) How are the perceived benefits (perceived usefulness, perceived playfulness) related to perceived cost (perceived concerns of privacy)?
- (3) How does privacy concern influence continuous use of OSNs?

To address these questions, we review related literatures and justify our research model and hypotheses. Also, to demonstrate our research model and hypotheses we empirically test them. This paper is organized as follows. First, we review literatures on privacy concerns, Technology Adoption Model (TAM) and other related studies. Based on these, we suggest our research model and hypotheses. In the next section, we test our conceptual model and hypotheses empirically. At the end, we conclude the paper.

**RESEARCH MODEL, HYPOTHESES & THEORETICAL BACKGROUND**

**Research Model**

When using information systems, users’ privacy concerns often involve an assessment of the potential privacy risks and benefits (Culnan and Armstrong, 1999). Based on the utility maximization theory, people compare the economic benefits with costs and then they decide whether to use online web sites (Rust, Kannan, and Na, 2002). People want to maximize positive outcomes and minimize negative outcomes. Awad and Krishman (2006) explain how customers’ degree of personalization and privacy concerns work in online site usage with consumers’ utility functions. In their model, benefits are derived through the degree of personalization which is received, and cost is a function of consumer privacy concerns, previous privacy invasion experience, and consumer-rated importance of information transparency and privacy policies (Awad and Krishman, 2006). Culnan and Bies (2003) argue that individuals will disclose personal information if they perceive the overall benefit of disclosure is at least balanced by the assessed risk of disclosure. They argue that “a positive net outcome should mean that people are more likely to accept the loss of privacy that accompanies any disclosure of personal information as long as an acceptable level of risk accompanies the benefits.” Based on these prior studies, we suggest two conceptual domains of influential factors on OSNs use: perceived benefits, and perceived costs. The perceived benefits consist of Perceived Usefulness (PU) of OSNs and Perceived Playfulness (PP) of OSNs, and the perceived costs are the privacy concerns of OSN users. Figure 1 shows our research model and hypotheses.

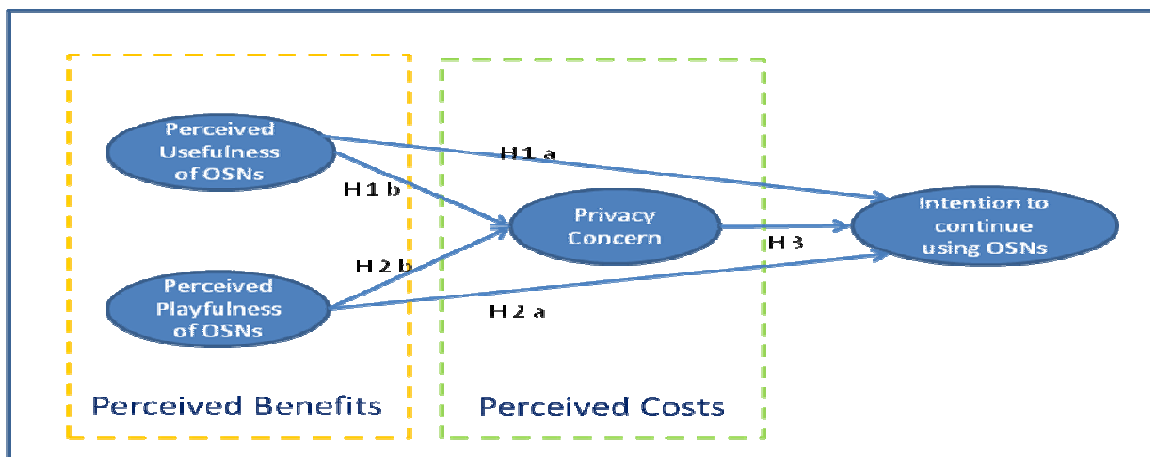


Figure 1. Research Model

OSN users will compare the perceived benefits and costs, and then they will decide whether they use OSNs or not. The conceptual domains have a significant meaning in the study. Prior privacy calculus related studies have not focused much on the mediation effect of privacy concern on users' behavior. In this model we would like to investigate whether perceived benefits (perceived usefulness of OSNs, perceived playfulness of OSNs) directly influence intention to continue using OSNs and privacy concerns, and how privacy concerns (costs) both directly influence intention to continue using OSNs and work as a mediator between perceived benefits and intention to use OSNs.

In this study, we do not consider "attitude." TAM and the theory of reasoned action (TRA) models suggest that perceived usefulness and ease of use influence the "attitude" toward information systems (IS) and then the attitude will influence intent to use IS or actual IS usage. Therefore, adding the attitude construct would create a plausible alternative model. However, in this study we assume that the attitude will be included in the process of recognizing concerns about privacy.

Bhattacharjee (2001) suggests researchers should examine IS continuance behavior rather than simply the concept of IT adoption. IS continuance is the result of a series of individual decisions to continue using a particular IS. In this paper, we focus on intention to continue using OSNs rather than new adoption of OSNs.

### ***Perceived Usefulness***

Davis (1989) defines Perceived Usefulness as "the degree to which a person believes that using a particular systems would enhance his or her job performance." The usefulness of information technology is an important antecedent to the intention of IT use (Davis, Bagozzi, and Warshaw, 1989). People will use OSNs because of perceived usefulness of the OSN for their social networking purposes. So, we suggest following hypothesis.

***H1a: Perceived usefulness will have a positive effect on intention to continue using OSNs.***

Users who have a high level of perceived usefulness are likely less sensitive to privacy concerns than others. The effect of perceived usefulness on intention to continue use should be partially mediated by privacy concerns. Thus, we propose:

***H1b: Perceived usefulness will have a negative effect on privacy concerns.***

### ***Perceived Playfulness***

Perceived playfulness is the degree to which a current or potential user believes that the online social network site will bring them a sense of enjoyment and pleasure (Moon and Kim, 2001). Van der Heijden (2004) studies the hedonic use of information technology. He points out that hedonic systems are more focused on providing self-fulfilling values rather than instrumental value by utilitarian systems (Van der Heijden, 2004). His study result shows that perceived enjoyment is a stronger determinant of intention to use than perceived usefulness. Moon and Kim (2001) suggest extended TAM model to adopting World Wide Web (WWW) by adding playfulness as a predictor of WWW adoption behavior. They argue that individuals who have more positive playfulness belief in the WWW will use it more than others and find that perceived playfulness has a direct effect on behavioral intention to use the WWW. They define playfulness as an intrinsic belief or motive shaped from the individual's experiences with the environment (Moon and Kim, 2001).

Dinev and Hart (2006) mention that "interest is an intrinsic motivation, a cognitive state or belief related to the self-fulfilling satisfaction derived from performing the activity, as distinct from an extrinsic motivation reflecting the force of behavior caused by an extrinsic outcome." Therefore, an individual's interest is an intrinsic motivation that can positively influence the willingness to disclose personal information (Dinev and Hart, 2006).

OSNs enable users to communicate with other users and to represent themselves for fun and for getting information. Based on previous research findings, we expect perceived playfulness will positively influence the intention to continue using OSNs and suggest this hypothesis.

***H2a: Perceived playfulness will have a positive effect on the intention to continue using OSNs.***

Additionally, users who have a high level of perceived playfulness are less sensitive to privacy concerns. The effect of perceived playfulness on the intention to continue using OSNs should be partially mediated by privacy concerns. Based on this, we propose this hypothesis.

***H2b: Perceived playfulness will have a negative effect on privacy concerns.***

### **Privacy Concerns**

Privacy concerns have become a critical challenge in the internet environment (Westin, 2003). In e-commerce research, Dinev and Hart (2006) suggest a privacy calculus model for e-commerce transactions. In their model, they emphasize privacy concerns are the major factor in e-commerce use. Privacy is defined as “the claim of an individual to determine what information about himself or herself should be known to others” (Westin, 2003).

Smith, Milberg, and Burke (1996) suggest that a taxonomy of consumer privacy concerns along a number of central dimensions: collection of personal information, unauthorized secondary usage, external unauthorized secondary usage of information, errors in personal information, and improper access. Dinev and Hart (2006) define internet privacy concerns as “concerns about opportunistic behavior related to the disclosure of personal information submitted by internet users in general.” They mention that privacy concerns are “beliefs about who has access to information that is disclosed when using the internet”. The greater the uncertainty about the access and use are, the greater the privacy concerns will be. (Dinev and Hart, 2006)

Based on the previous literature, we define privacy concerns in OSNs as ***concerns about disclosure of personal information submitted by OSN users.***

Liu, Marchewka, Lu, and Yu (2004) show that concerns about privacy are potential obstacles in electronic commerce. They test how concerns about privacy relate to an individual’s behavioral intention to make an online transaction. In the research, privacy strongly and negatively influences the user’s behavioral intention. Sheng, Nah, and Siau (2008) also expect that privacy concerns influence the intention to adopt ubiquitous commerce service. They divide services into personalized services and non-personalized services. Privacy concerns have a negative impact on intention to adopt personalized services but not on non-personalized services. This means that people (service providers) provide more personal information to others; they are more considerate of privacy concerns when adopting Information Systems. According to the concept of personalization privacy paradox, personalization triggers privacy concerns which influence users’ intention to adopt e-commerce systems (Sheng et al., 2008). To join OSNs, people should provide personal information and share them with others, so people may consider their privacy more.

In previous research on OSNs, researchers emphasized playfulness, social capital and trust as influential factors on adoption of OSNs. However, there are a few studies on the relationship between privacy concerns and intention to use online social network sites.

It appears that privacy is a critical issue in OSNs. For example, a report in 2007 showed that the CIA was recruiting spies on Facebook using a group that already has 2,500 members since its launch in December 2007. Also, in November 2009, Twitter was plagued by Database (DB) spam attacks. The DB spam attacks, probably being spread by hacked accounts, contained suspicious content. Since openness is a main characteristic of OSNs, so we definitely need to disclose our personal information in OSNs use. Based on previous research and OSN characteristics, we suggest that privacy concerns, which are triggered by other factors, will influence the intention to use OSNs, and it will mediate the perceived benefits. In other words, we would like to know how high levels of perceived benefits reduce concerns about privacy, and whether privacy concerns influence the intention to use OSNs. We suggest this hypothesis.

***H3: Privacy Concerns will negatively influence Intention to continue using OSNs.***

Following table shows the definition of each construct.

<b>Construct</b>	<b>Definition</b>	<b>Literature</b>
Perceived Usefulness	The degree to which a person believes that using OSNs would enhance his or her social networking performance	Davis (1989) Davis et al. (1989)
Perceived Playfulness	The strength of person's belief that interacting with OSNs would fulfill his or her intrinsic motives	Moon and Lee (2001)
Privacy Concerns	Concerns about disclosure of personal information submitted on OSNs by user	Dinev and Hart (2006)
Intention to continue using OSNs	Plans to continue using OSNs	Davis et al.(1989)

**Table 1. Definition of Constructs**

## METHODOLOGY

### *Data Collection*

This study examines how perceived benefits (perceived usefulness, perceived playfulness) and perceived costs (privacy concern) affect intent to continue OSN use. To test our research model, we conducted empirical tests using survey data. We developed a questionnaire and items based on a literature review to ensure content validity (Appendix 1). Items are measured by the seven point Likert scale.

The survey participants for this study are undergraduate business students in a large Midwestern U. S. university who have used OSNs such as Facebook and Myspace. Students are appropriate for the test because 29% of unique visitors to Facebook are between 18 and 24 years of age and 33% of Twitter users are from between 18 and 29 years of age (Pew Internet, 2009). We first described online social network sites, and then asked respondents to answer survey questions. We had 391 usable surveys among 540 total responses.

### *Data Analysis and Hypotheses Testing*

The research model was tested using EQS 6.1. First, we tested the measurement model. To investigate the validity of each construct, Confirmatory Factor Analysis (CFA) was carried out. Then we tested the hypotheses with the structural model.

#### *Measurement Model*

In the measurement model testing process, we validated the construct validity and reliability. First, we checked the internal consistency of constructs based on Cronbach's  $\alpha$ . Next, we conducted CFA. Based on the multivariate Lagrange Multiplier (LM) test, we checked whether items are cross-linked to multiple constructs. To satisfy the SEM assumptions, we checked whether the model satisfied multivariate normality using skew and kurtosis. All of the constructs were statistically normally distributed.

We also checked the convergent validity and discriminant validity. The convergent validity represents the level of correlation among measurement items. To assess convergent validity, we checked the standardized loading ( $\lambda$ ) of each item, average variance extracted (AVE) and construct reliability (CR). For convergent validity, the standardized loading ( $\lambda$ ) of each item should be greater than 0.5 (Fornell and Larcker, 1981) and be statistically significant. As we can see in Table 2, all factor loadings are above 0.5. The high values support convergent validity. Also all AVE are greater than 0.5 which supports convergent validity (Fornell and Larcker, 1981).

Construct	Measurement Item	Standardized $\lambda$	AVE	CR
Perceived Usefulness	PU1	.918	.64	.88
	PU2	.940		
	PU3	.953		
	PU4	.864		
Perceived Playfulness	PP1	.939	.70	.87
	PP2	.880		
	PP3	.956		
Privacy Concerns	PRVCON1	.801	.58	.85
	PRVCON2	.795		
	PRVCON3	.903		
	PRVCON4	.901		
Intention to continuous use	USECON1	.956	.77	.93
	USECON2	1.00		
	USECON3	.933		

**Table 2. Validity and Reliability**

We also calculated construct reliability (CR) to assess reliability and convergent validity. All CR are above the recommended values of 0.7. Therefore, the constructs of the measurement model have convergent validity and reliability.

For discriminant validity, the estimated correlations between all pairs of constructs should be significantly less than 1 (or .9) (Bagozzi and Yi, 1988). Table 3 shows that all correlations between constructs are significantly different from 1, and each correlation is less than the corresponding AVE square roots. Thus, construct level discriminant validity is established.

Constructs	Correlation			
	Perceived Usefulness	Perceived Playfulness	Privacy Concerns	Intention to continuous use
Perceived Usefulness	<b>.80*</b>			
Perceived Playfulness	.53	<b>.86*</b>		
Privacy Concerns	.00	.05	<b>.73*</b>	
Intention to continue using OSNs	.47	.56	.00	<b>.87*</b>

**Table 3. Correlation and Discriminant Validity (\*: The square root of the AVE)**

The CFA results show (Table 4) that the exact fit between the model and the data set ( $\chi^2 = 6208.761$  on 91 df), Comparative Fit Index (CFI) = 0.982, and root mean square error of approximation (RMSEA) = 0.064. All model fits are at an acceptable level.

Index	Measurement Model	Acceptable Level
$\chi^2(p)$	6208.761 (.0000)	Not significant
df	91	-
NFI	.971	>0.90
NNFI	.976	>0.90
CFI	.982	>.90 or >.95
GFI	.940	>0.9
AGFI	.908	>0.8
SRMR	.036	<0.08
RMSEA (90% CI)	.064 (.053, .076)	<0.08

**Table 4. Model fit of CFA**

#### Structural Equation Model

After conducting the measurement model test, we estimated the structural model to demonstrate the research model and hypotheses (Anderson and Gerbing, 1988). The results revealed an acceptable fit between the theoretical model and the empirical covariance provided by the sample (See Table 5,  $\chi^2 = 6208.761$  on 91 df, CFI = 0.982, NFI = 0.972, RMSEA = 0.065). These indices are above the acceptable levels, so it can be concluded that the hypothesis testing based on this model is reliable. Since overall measurement model fit indices are acceptable, as presented in Table 5, we tested the hypotheses.

Fit Index	Structural Equation Model	Acceptable Level
$\chi^2(p)$	6208.761(.00)	Not significant
Df	91	-
NFI	.972	>0.90
NNFI	.976	>0.90
CFI	.982	>.90 or >.95
GFI	.941	>0.9
AGFI	.907	>0.8
RMSEA (90% CI)	.065 (.053, .076)	<0.08
SRMR	.026	<0.08

**Table 5. Structural Equation Model Fit**

In the structural model, we focus on whether each construct is statistically significantly associated with each other and what the direction of causality is. Table 6 shows that standardized parameter estimates of the structural model.



Hypothesis	Direction	Standardized parameter estimates	Results of Hypotheses tests (p<.05)
H1a	Perceived Usefulness → Intention to continue using OSNs (+)	0.228	Significant ( <i>Support</i> )
H1b	Perceived Usefulness → Privacy Concern (-)	-0.053	Not significant (Does not Support)
H2a	Perceived playfulness → Intention to continue using OSNs (+)	0.441	Significant ( <i>Support</i> )
H2b	Perceived playfulness → Privacy Concern (-)	0.036	Not significant (Does not Support)
H3	Privacy Concern → Intention to continue using OSNs (-)	-.066	Not significant (Does not Support)

Table 6. Results of SEM

According to the results (Table 6), only the direct effects of perceived usefulness and playfulness on the intention to continue using OSNs are supported (H1a, H2a). These results show that the perceived benefits factors do not influence the sensitivity of privacy concerns. Additionally, we cannot find any significant effect of privacy concerns on intention to continue using OSNs. To validate the mediation effect, we tested the direct effect of perceived benefits (usefulness and playfulness) on both privacy concern and intention to use. Also, we tested the direct effect of privacy concerns on intention to use. Mediation effects do not exist, so we did not test these effects formally (Baron and Kenny, 1986)

From these empirical results, we can conclude that privacy concerns do not significantly affect users' intention to continue using OSNs. In addition, the cognitive calculation process does not operate as predicted in OSN use intention.

## DISCUSSION AND CONCLUSION

The literature suggests that privacy is a critical issue in online social networks (OSNs). Therefore, privacy concerns should affect users' intention to use OSNs along with the benefits from using OSNs. Prior studies show that people use online websites and e-commerce transactions when the net benefits (perceived benefits - perceived costs) is zero or above zero (Dinev and Hart, 2006). The perceived usefulness and perceived playfulness are benefits which people gain from IS usage, and the privacy concerns are the costs of IS usage. If people perceive more benefits, they will be less sensitive to the costs than others.

In this paper, we propose a conceptual framework to explain an individual's intention to use OSNs. We examine the direct effect of each perceived benefit factor (perceived usefulness, perceived playfulness) and perceived cost factor (privacy concerns). Also, we test how these two factors are entangled in a cognitive calculation process.

The empirical test results support the direct relationship between perceived benefits and people's intention to use OSNs. One interesting finding is the effect of perceived playfulness on intention to continue using OSNs is slightly greater than the effect of perceived usefulness. Based on this result, we expect that people may use OSNs for hedonic purpose rather than for utilitarian purpose. However, the empirical results do not support any of the proposed effects of privacy concerns including mediation effects. Neither does it support the effect of the benefits on privacy concerns. This result may be explained in three ways. First, OSN users do not much care as much about privacy issues as OSN providers and society believe they should. Users mainly focus on the benefits which they will gain from continuing to use OSN, because the benefits are the purpose of their usage. They might recognize the privacy risks are very small or they might not consider benefits and costs at the same time. They may value privacy little in an OSN context (Acquisti, John, and Loewenstein, 2009). Second, we may exclude

other factors which influence privacy concerns. Third, users may feel their privacy is properly controlled using OSN features. In this paper, we do not test the habitual use of OSNs and other perceived benefits (e.g., social capital). The unintentional use may differentially affect the intention to use OSNs and privacy concerns. Also, the different types of benefits may generate different effects. In future studies, we need to investigate other factors too.

Although several hypotheses are not supported, this study presents several contributions. First, we develop a mediated conceptual model based on prior studies and empirically test factors which influence intention to continue using OSNs. To enhance the reliability of the results, constructs and measurements are developed based on theories and a literature review. Second, we test the role of privacy concerns in OSN usage. Because one of the fundamental characteristics of OSNs is openness, the privacy problem should be handled more carefully.

This study not only provides insight on how to explain and predict individuals' intention to use OSNs for researchers, but it can also help explain how to maintain the wonderful virtual spaces and improve their values for OSN providers.

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- <http://www.pewinternet.org>

## APPENDIX 1. ITEMS AND SCALES

Construct	Item	Scale (7 Likert Scale)
Privacy Concern	<p>I am concerned that the information I submit on MySNW.com could be misused.</p> <p>I am concerned that a person can find private information about me on MySNW.com.</p> <p>I am concerned about submitting information on MySNW.com, because of what others might do with it.</p> <p>I am concerned about submitting information on MySNW.com, because it could be used in a way I did not foresee.</p>	Not at all concerned (1) -Very concerned (7)
Perceived Usefulness	<p>Using MySNW.com improves my performance in online social networking.</p> <p>Using MySNW.com increases my productivity in online social networking.</p> <p>Using MySNW.com enhances my effectiveness in online social networking.</p> <p>I find MySNW.com to be useful for online social networking.</p>	Not at all(1) - Strongly agree (7)
Perceived playfulness	<p>I find using MySNW.com to be enjoyable.</p> <p>The actual process of using MySNW.com is pleasant.</p> <p>I have fun using MySNW.com.</p>	Not at all(1) - Strongly agree (7)
Intend to continue use OSNs	<p>In the near future, I intend to continue using MySNW.com.</p> <p>I intend to continue using MySNW.com.</p> <p>I predict that I would continue using MySNW.com.</p>	Not true at all(1) – Very true (7)