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lin, xiaolin and Hajli, Mahmood, "Information Sharing on Social Networking Sites: the role of perceived control of information and gender" (2013). *WISP 2012 Proceedings*. 36.
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Information Sharing on Social Networking Sites: the role of perceived control of information and gender

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ABSTRACT

IS researchers have reported users' concerns about their privacy and security on social networking sites. SNS users are in great need of better protection of their information shared. This paper investigates the influences of perceived control of information on SNS users' information sharing behavior. Using an empirical study, this paper confirms the important role of perceived control in SNS users' information sharing behavior. Specially, perceived control of information has been found to significantly influence SNS users' perceived privacy risk and attitude towards information sharing, which in terms impact their information sharing behavior. In addition, gender has been found a significant factor that moderates the influences of perceived control of information and perceived privacy risk on SNS users' attitude towards information sharing. Theoretical and practical implications are discussed.

Keywords: perceived control, privacy risk, information sharing, social networking sites, gender

INTRODUCTION

Social networking sites enable their users to share various kinds of information such as personal information, ideas, and experiences. Information sharing is considered as an important

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motivation for people to join online communities (Ridings and Gefen 2004). According to a national survey conducted by the Consumer Reports National Research Center in 2010, more than 40 percent of social network users share their private information online, which make themselves open to various online dangers such as scams and identify theft. Users' private information could be easily collected, disclosed and used with or without their own acknowledge and consent. *Privacy risk* is essential for SNS user's decision making about information sharing, and they need better control over the information they post online (Krasnova et al. 2010). IS researchers have also reported SNS user's concerns about their privacy and security, which is another signal that users need better protection of their information shared on SNS (Barnes 2006). There is no doubt that SNS users are in great need of better control over information in order to protect their privacy. SNS offers are taking ways to help their users to control personal information and protect their privacy on social networking sites through the designed features (e.g. privacy settings) and/or privacy policy. Therefore, understanding more clearly how perceived control over information and privacy risk impact SNS user information sharing decision making has important implications for practitioners and academicians.

Privacy risk has persistently been a major concern in SNS research and is defined as "an individual's interests and abilities in controlling the handling of data about themselves" (Bélanger and Crossler 2011; Westin 1968). Perceived privacy risk has been a critical concern for online users when disclosing information on social networking sites (Krasnova et al. 2010). The current research of information privacy risk has focused on explaining and predicting theoretical contribution and lacks for an understanding on design and action contributions (Bélanger and Crossler 2011). In this paper, we investigate the influence of perceived control on SNS user decision making about information sharing. Perceived control has been generally

studied with privacy concerns and trust (Xu 2007; Xu and Teo 2004), however, the effects of perceived control of information on SNS users' information sharing behavior has not been empirically tested yet.

Generally, perceived control has been interpreted as the actual behavioral control in IS research (Kamis et al. 2008; Pavlou and Fygenon 2006), which focuses on an individual's perception of his/her ability to perform a given behavior (Ajzen 1991). Such a focus on actual behavior control has excluded the psychological perception of control that may not directly involve behavioral attempts to effect a change (Xu et al. 2012, p. 1346). Considering a lack of study on perceived control from the psychological perspective, we focus on SNS user's psychological perception of control over information they post on SNS, rather than their actual behavior control. We defined *perceived control* as "the extent to which an individual feels that web systems allows that individual to control what information is shared and who information is shared with" in the context of this study.

Furthermore, gender has been generally studied as a moderator that impact people's information technology adoption and usage (Ahuja and Thatcher 2005; Lin et al. 2013; Venkatesh and Morris 2000). In the context of social networking sites, prior gender-based studies have mainly focused on gender differences in adoption and continuance (Lin et al. 2013; Zhang et al. 2009). An enhanced understanding of gender-based differences in information sharing behavior has also implications for both practitioners and academicians.

Therefore, this study seeks to accomplish the following two objectives:

1. To propose a research model that explains the influence of perceived control of information on users' information sharing behavior on SNS from the psychological perspective

2. To investigate gender differences in SNS users' information sharing behavior

The remaining of this paper is organized as follows. Firstly, we represent a literature review on perceived control of information, which lead to the research model and justifications of the hypotheses. Next, the chosen research methodology, data analysis and results are presented. Finally, we conclude with a discussion of the research and practical implications.

LITERATURE REVIEW AND RESEARCH MODEL

Literature review

A literature review of perceived control

Perceived control stems from the belief about the extent to which people have control over the environment (Skinner 1996). The conceptualization of perceived control is borrowed from social psychology and is a cognitive/subjective construct that differs from practical usage of control (Langer 1975). In the psychology research, perceived control is generally considered as a more power predictor influencing people's emotion and behavior than the actual control (Averill 1973; Burger 1989; Skinner 1996).

In IS research, perceived control over personal information is an important debate on information privacy studies (Belanger et al. 2002) particularly with the emergence of social media. Perceived control has important influence in alleviating users' privacy concerns regarding their personal information on social networking sites (Hoadley et al. 2010; Krasnova et al. 2010). Social networking sites enable users to control their information and privacy but many individuals are not aware of control of information (Govani and Pashley 2005). In this research, we investigate the consequence of perceived control of information from the psychology perspective, more specially users' decision making about information sharing on SNS.

Research Model

The thesis of our research model is based on the argument that the influence of perceived control of information depends on how much it mitigate users’ perception of perceived privacy risk about information sharing on SNS. Specially, we are investigating the influence of perceived control of information on perceived privacy risk and attitude towards information sharing, which in terms impact SNS users’ actual information sharing. In this paper, we focus on quantity of information sharing (Chiu et al. 2006). **Figure 1** shows our research model.

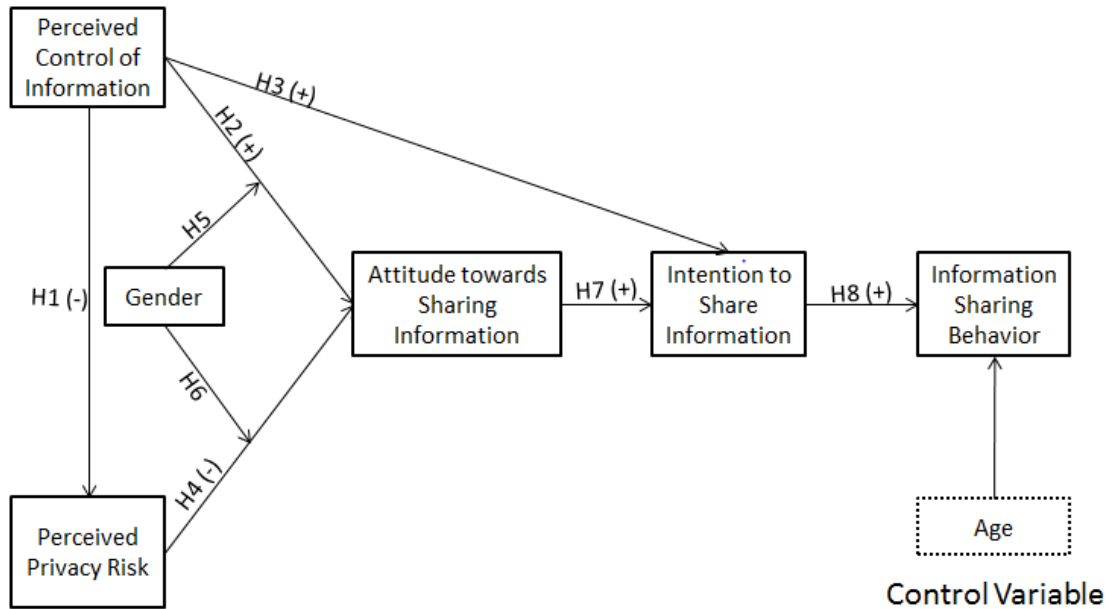


Figure 1. Research model.

HYPOTHESIS DEVELOPMENT

The Effect of Perceived Control on Privacy Risk

Perceived control of information could be viewed as an active component of information privacy on SNS. People’s perception of privacy concerns empirically has been demonstrated to

be diminished by effective controlling mechanisms (Xu et al. 2008). SNS users' lower of perceived control over private information induced News Feeds on Facebook has led to their higher perception of privacy intrusion (Hoadley et al. 2010). Thus, the higher SNS users' perceived control of information is, the less their perceived privacy risk is.

H1: *Perceived control of information is negatively related to perceived privacy risk.*

The Effect of Perceived Control on Attitude and Intention

Prior psychology research has indicated that people's perceived control influence their emotion and behavior (Averill 1973; Skinner 1996). An individual's perceived control over the environment formulates a desired outcome such as user acceptance of information systems (Baronas and Louis 1988). An individual's psychological perception of control contributes to his/her desire for an actual behavior. Regarding information sharing decision making on SNS, a user's perceived control will trigger their desire to share information. SNS users' control over information is essential when they make decision about disclosing information on SNS websites such as Facebook and twitter (Krasnova et al. 2010; Lin et al. 2013). Higher perception of information control generates more positive attitude, as SNS users will less worried about data collection when they share their personal information on SNS. SNS tend to share their information if they have higher perceived control of information.

H2: *Perceived control of information positively impacts users' attitude towards information sharing on SNS.*

H3: *Perceived control of information positively impacts users' intention to share information on SNS.*

The Effect of Privacy Risk on Attitude

Some prior studies have demonstrated that information privacy concerns influence individual's attitude such as the willingness to conduct online transactions (Van Slyke et al. 2006), and the willingness to share personal information online (Dinev and Hart 2006). Transferring to SNS, perceived privacy risk impacts SNS users' decision making about sharing information.

H4: *Perceived privacy risk negatively impacts users' attitude toward information sharing on SNS.*

The Effects of Perceived Control and Privacy Risk on Attitude across Gender

Prior research indicates that men and women differ in their perceptions of risk (Gustafsson 1998) as well as their risk taking behavior (Dwyer et al. 2002; Powell and Ansic 1997). Generally, women are believed to have consistently higher levels of concern about risk and men will be more willing to take risks (Davidson and Freudenburg 1996; Dwyer et al. 2002). For example, Dwyer et al. (2002) reported that women exhibit less risk-taking than men in their mutual fund investment decision by conducting a national study of mutual fund investors. In addition, Garbarino and Strahilevitz (2004) found that women perceive a significantly higher level of risk and higher level of negative outcomes in online shopping. In IS research, women show higher level of privacy concerns (Chai et al. 2011) and gender differences are also confirmed in the influences of perceived risk on online consumer's decision making (Featherman and Brooks 2013) and technology adoption (Lin et al. 2013). Therefore, we hypothesize:

H5: *The positive relationship between perceived control of information and attitude towards information sharing is stronger for women than for men.*

H6: *The negative relationship between perceived privacy risk and attitude towards information sharing is stronger for women than for men.*

Attitude, Intention, and Behavior

Generally, an individual's attitude toward information sharing is associated with that individual's intention to share information online (Fishbein and Ajzen 1975). Attitude has been found to have positive influence on behavior intention decisions in various domains, including technology adoption (Hsu and Lin 2008).

TRA suggests that an individual's behavior intention is associated with his/her actual behavior. Prior research confirms the positive relationship between intention and behavior in IS discipline (Venkatesh and Morris 2000). In the context of social networking sites, an individual will be more likely to share information if he/she has greater intention to share information online than others. Thus, we hypothesize:

H7: *Users' attitude is positively associated with their intention to share information on SNS.*

H8: *Users' intention to share information is positively associated with their actual information sharing on SNS.*

RESEARCH METHOD

Data Collection

We conducted the research study at a large university in north western United States. The survey was posted online and about 500 college students were invited to take part in this study. A total of 428 responses were received, result in 85.6% response. Participants were asked questions

about their perceptions of social networking systems usage and information sharing behavior. And they received nominal course credit for participating in this study. After incomplete surveys were deleted, 405 valid responses remained. All the participants were currently SNS users and active in sharing their information at least in one social networking site. More than half of the participants (62%) are currently active in sharing information in two or more social networking sites such as Facebook, Twitter, and LinkedIn. Table 1 summarizes the respondents' demographic profile.

Table 1. Demographics

Male	57.2% (232 subjects)
Female	42.8% (173 subjects)
Age	78.3% between 18-22
Computer experience	11.5 years

Measurement

The utilized measures were adapted from prior studies with each item measured using a seven-point Likert scale with anchors “strongly disagree/agree”. The measurement items utilized, their sources and psychometric properties are shown in Table 2. A pilot study (N=90) was performed to validate the instrument. In addition, cross loadings for measurement indicators are presented in **Appendix A**.

Table 2 .Constructs, items with factor loadings and sources.

Constructs		Loading	Source
Perceived control of information (Cronbach's Alpha =0.89)	CON1. I feel in control over the information I provide on SNS.	0.88	(Krasnova et al. 2010)
	CON. Privacy setting allows me to have full control over the information I provide on SNS	0.92	
	CON. I feel in control of who can view my information on SNS.	0.91	
Privacy risk (Cronbach's Alpha =0.94)	PR1. I am concerned that SNS is collecting too much personal information about me.	0.93	(Pavlou et al. 2007; Yin et al. 2011)
	PR2. I am concerned about the privacy of the personal information that SNS captures about me.	0.95	
	PR3. I suspect that my privacy is not well protected by SNS.	0.89	
	PR4. I'm worried that unknown third parties will access my personal information on SNS.	0.91	
Attitude (Cronbach's Alpha =0.94)	Notes: this construct uses 7-point semantic differential scale		(Fishbein 1963)
	ATT1. Sharing information is a (bad/good) idea.	0.93	
	ATT2. Sharing information is a (foolish/wise) idea.	0.91	
	ATT3. Sharing information is (unpleasant/pleasant).	0.90	
	ATT4. I (dislike/like) the idea of Sharing information.	0.92	
Intention to share information (Cronbach's Alpha =0.87)	BI1. I intend to continue sharing information on SNS in the future.	0.91	(Venkatesh et al. 2012)
	BI2. I plan to continue sharing information on SNS frequently.	0.88	
	BI3. I will always try to share information SNS in my daily life.	0.91	
Information Sharing (Cronbach's Alpha =0.93)	SHARE1. I frequently participate in information/knowledge sharing activities on SNS.	0.78	(Chai et al. 2011; Davenport and Pruzak 2000; Hsu et al. 2007)
	SHARE2. I usually spend a lot of time updating new information on SNS.	0.92	
	SHARE3. I frequently update information on SNS.	0.92	
	SHARE4. I frequently share my experience or knowledge with others on SNS.	0.92	
	SHARE5. When participating on SNS, I usually actively share my information and knowledge with others.	0.87	

ANALYSIS AND RESULTS

The measurement model was estimated using factor analysis to test whether the construct have sufficient validation and reliability. Partial Least Square (PLS) was used to test the structural model. SmartPLS 2.0 was used to analyze the research model (Ringle et al. 2005) .

Measurement Model

Factor loading and average variance extracted were used to test the convergent validity and reliability of each variable in this study. We used established reliability and validity criteria to test the reliability and validity of the measurement instrument (Hair Jr et al. 2006). **Table 2** shows that all the factor loadings are higher than 0.7, which is the common rule of thumb for acceptable item loading.

Average variance extracted, Composite reliability (CR), the root of AVE, and correlations among each construct are reported in **Table 3** as following. AVE for each construct is above 0.5, which indicates that the latent factors can explain at least 50% of the measured variance. All the CRs are higher than 0.9, which is greater than the critical value of 0.7. To satisfy the discriminant validity, the square root of AVE should be greater than the inter-scale correlation (Fornell and Larcker 1981). The elements along the diagonal are much greater than the off-diagonal elements. The analyses confirmed convergent validity and reliability of the measurement model. Discriminant validity is also satisfied.

Considering the relatively high correlation among some variables, we also checked for multicollinearity by calculating the variance inflation factor (VIF). The resultant VIF values are between 1.1 to 1.5, which are all acceptable, suggesting that multicollinearity is not a problem for the data of this study.

Table 3. Correlations matrix with CR and AVE

Constructs	AVE	CR	Correlations					
			1	2	3	4	5	
1. Attitude	0.84	0.95	0.92					
2. Perceived control of information	0.82	0.93	0.32	0.91				
3. Information Sharing behavior	0.78	0.95	0.39	0.39	0.88			
4. Intention to share information	0.79	0.92	0.4	0.37	0.6	0.89		
5. Perceived privacy information risk	0.84	0.96	-0.26	-0.29	-0.09	-0.11	0.92	

Notes: Square Root of AVE shown in bold as the diagonal

Structural Model

Partial Least Square (PLS) was used to analyze the structural model. **Figure 2** shows the results of structural model test. The R^2 shows that the research model explains 8.5% of the variance in privacy risk, 13.4% of the variance in attitude toward information sharing, 22.5% of the variance in intention to share information, and 46.5% of the variance in information sharing behavior. **Table 4** also reports detailed information of the standardized path coefficients and t-values for each path of the research model.

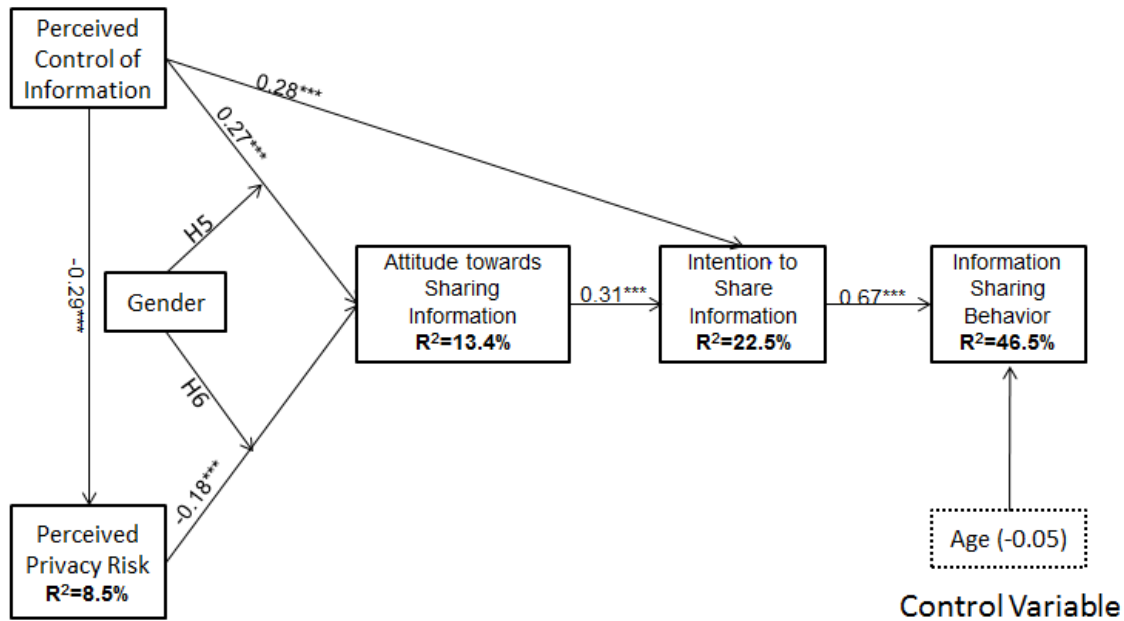


Figure 2. Research Results for the Structural Model Testing.

* 0.05 significance; ** 0.01 significance; ***0.001 significance; NS = statistically not significant

Table 4. Path Coefficients and t-values for the whole sample

Hypothesis	Constructs	Standardized path coefficient	t-value	Support or not
H1	Perceived control – Privacy risk	-0.29***	4.8	Yes
H2	Perceived control– Attitude	0.27***	4.68	Yes
H3	Perceived control– Intention to share information	0.28***	4.41	Yes
H4	Privacy risk – Attitude	-0.18***	3.5	Yes
H7	Attitude– Intention to share information	0.31***	5.57	Yes
H8	Intention to share information – Information sharing behavior	0.68***	18.69	Yes

* 0.05 significance; ** 0.01 significance; ***0.001 significance; NS = statistically not significant.

Further, to statistically test gender difference on each relationship in this study, we used multi-group PLS (Qureshi and Compeau 2009) . Prior studies have indicated that multi-group

PLS is valid technique for testing subgroup differences (Lin et al. 2013). Table 5 shows the results of gender-based subgroup analysis of our study.

Table 5. Gender-based subgroup analysis.

Hypothesis	Constructs	Women (n=173)		Men (n=232)		Standardized Comparisons of paths (t-value)	Support or not
		Standardized path coefficient	t-value	Standardized path coefficient	t-value		
H5	Perceived control–Attitude	0.29***	3	0.27***	3.5	2.36*	Yes
			1				
H6	Privacy risk – Attitude	-0.2**	2	-0.16*	2.26	-5.53***	Yes
			4				

* 0.05 significance; ** 0.01 significance; ***0.001 significance; NS = statistically not significant.

Our research results indicate that all the hypotheses are supported. Perceived control of information has been found to significantly impact users' attitude towards information sharing and their intention to share information, which in terms impact their actual information sharing behavior on social networking sites. Perceived privacy risk partially mediates the effect of perceived control on SNS users' attitude towards information sharing. Further, data analysis confirms that perceived control of information has a great positive affect on female SNS users' attitude towards information sharing than on male SNS users'. It also confirms that perceived privacy risk has a greater negative impact on female SNS users' attitude toward information sharing than on male SNS users'. In conclusion, perceived control of information has significant influence on users' information sharing behavior and gender differences exist in the context of social networking sites.

DISCUSSION AND CONCLUSION

Theoretical Contribution

First, our research provides good evidence that perceived control of information has significant influences on SNS users' information sharing behavior. Perceived control of information is shown to mitigate SNS users' perceived privacy risk, which in terms impact their decision making about information sharing behavior and actual information sharing behavior. Perceived control of information could also directly impact their decision making about information sharing behavior, which in terms impact their actual information sharing behavior. This finding is very valuable, as it provides further understanding on how SNS users' perceived control of information impacts their information sharing behavior. Rather than focusing on the relationship between perceived control and privacy concerns, this study takes the first step to investigate the influence of perceived control of information on user behavior on SNS.

Second, this paper confirms gender moderates the effects of perceived control and privacy risk on attitude toward information sharing on SNS. The data analysis indicates that the perceived control and privacy risk have greater influence on women's attitude towards information than on men's attitude. It contributes to gender-based differences literature by extending it to information sharing on SNS.

Practical Contribution

Our research confirms that perceived control of information could significantly mitigate SNS users' perceived privacy risk. Taking advantage of this finding, SNS offers could reduce their users' perceived privacy risk by providing more effective ways for them to control over

information such as implementing effective privacy setting and generating privacy policies. In addition, gender has been found a significant factor that impact SNS users' information sharing. This finding will provide some important information to purveyors of social networking sites as well as business engaged in SNS. Be aware of gender difference, SNS designers could develop more user-friendly design features. Businesses could more effectively collect their information from their stakeholder depending on different genders.

Limitations and Suggestions for Future Research

Our subjects were college students, which are diverse in terms of majors, education background, and work experience. This may be a limitation for our study and future research may base on different subject environments such as business firms. In addition, social networking sites are in a global environment, and it may be interesting to look at culture differences in future study.

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APPENDIX A. CROSS LOADINGS FOR MEASUREMENT INDICATORS

	ATT	CON	INTENT	PRISK	SHARE
ATT1	0.93	0.3	0.36	-0.22	0.36
ATT2	0.91	0.28	0.34	-0.23	0.36
ATT3	0.9	0.3	0.34	-0.24	0.32
ATT4	0.92	0.3	0.4	-0.26	0.39
CON1	0.3	0.88	0.33	-0.24	0.35
CON2	0.29	0.92	0.32	-0.26	0.36
CON3	0.29	0.91	0.36	-0.29	0.36
INTENT1	0.35	0.31	0.86	-0.05	0.52
INTENT2	0.37	0.34	0.94	-0.12	0.64
INTENT3	0.34	0.34	0.86	-0.12	0.64
PRISK1	-0.23	-0.25	-0.1	0.93	-0.1
PRISK2	-0.24	-0.26	-0.11	0.95	-0.11
PRISK3	-0.25	-0.29	-0.13	0.89	-0.09
PRISK4	-0.23	-0.27	-0.07	0.91	-0.04
SHARE1	0.29	0.34	0.5	-0.03	0.78
SHARE2	0.33	0.36	0.6	-0.08	0.92
SHARE3	0.37	0.32	0.61	-0.1	0.92
SHARE4	0.36	0.36	0.63	-0.08	0.92
SHARE5	0.36	0.35	0.64	-0.11	0.87

Notes: Boldface values indicate factor loadings. ATT=Attitude towards sharing information; CON=Perceived control of information; INTENT=Intention to share information; PRISK=Privacy risk; SHARE=Information Sharing