Computers in Human Behavior 52 (2015) 278–292

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Location information disclosure in location-based social network services: Privacy calculus, benefit structure, and gender differences

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ARTICLE INFO

Article history:
Available online 19 June 2015

Keywords:
Location-based service
Social networks
Information disclosure
Privacy calculus
Benefit structure
Gender difference

ABSTRACT

As the mechanisms underlying users' location information disclosure behavior under the context of location-based social network services (LBSNS) have been rarely investigated, this study builds a research model to examine the privacy calculus, benefit structure and gender differences. Specifically, hedonic benefits have stronger impacts on perceived benefits than utilitarian benefits and there is an interaction effect between perceived benefits and privacy risks. Further, utilitarian (hedonic) benefits are more influential for males (females) than for females (males) when formulating overall benefit perceptions, and perceived benefits (privacy risks) have stronger impacts on disclosure intention for males (females) than for females (males). Theoretical and practical implications are also discussed.

1. Introduction

The development and integration of social networking technologies, location-based services, and mobile technologies has prompted the emergence of a variety of new services under the umbrella of SoLoMo (i.e., Social, Local, and Mobile) (Shim, Dekleva, Guo, & Mittleman, 2011; Varnali & Toker, 2010). Specifically, online social network services have been extended to the mobile context in which users can "check in" to specific locations or share location-related information such as photographs and activities (Zhao, Lu, & Gupta, 2012). This new type of social network services is termed as the location-based social network services (LBSNS) because of its emphasis on the location-based information (Zhao et al., 2012). In the past few years, the number of LBSNS has rapidly increased around the world. For example, Fusco, Michael and Michael had listed more than 100 LBSNS applications Fusco, Michael, and Michael (2010) and Zhao et al. (2012) also figured out there were more than 40 LBSNS applications with 3.3 million subscribers in China by the end of 2010.

The immense business potential of LBSNS has urged both scholars and practitioners to consider how to sustain it. As the web 2.0 technology relies heavily on the user-generated content, the survival and sustainability of LBSNS which is a special type of web 2.0 technology depends on users' continuous content contribution (Chiu, Cheng, Huang, & Chen, 2013; Fang & Neufeld, 2009). Specifically, like other forms of social networks which are called as self-disclosure technologies (Lowry, Cao, & Everard, 2011), the user-generated content in LBSNS refers to the interpersonal communication between users and their self-disclosure. Considering the emphasis on location information in LBSNS, users' content contribution in LBSNS is closely associated with their location information disclosure. Therefore, understanding the factors that influence users' location information disclosure behavior is of great theoretical and practical importance.

Previous studies on information disclosure have focused on the privacy issue raised by the self-disclosure behavior in a variety of research contexts (Ngai, Tao, & Moon, 2015), such as e-commerce (e.g., Awad & Krishnan, 2006; Xu, Teo, Tan, & Agarwal, 2009), e-health (e.g., Anderson & Agarwal, 2011; Angst & Agarwal, 2009), and social networking sites (e.g., Chiu et al., 2013; Krasnova, Spiekermann, Koroleva, & Hildebrand, 2010; Zhao et al., 2012). Most of these studies have drawn upon the privacy calculus model or the justice theory to address this issue. The privacy calculus model argues that individuals make privacy decisions according to their evaluations on the risks and benefits induced by the information disclosure behavior (Dinev & Hart,

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http://dx.doi.org/10.1016/j.chb.2015.06.006
0747-5632/

2006a). Specifically, this model suggests that perceived risks are negatively associated with information disclosure while perceived benefits are positively associated with information disclosure. This model is derived from the justice theory or equity theory which postulates that individuals face the trade-off between benefits and costs, such that they try to commit the behaviors with higher benefits given the same costs or the behaviors with lower costs given the same benefits (Adams, 1963). However, there are several research gaps to be filled.

First, although previous studies, based on the justice theory, have recognized the importance of trade-off between privacy risks and benefits, most of these studies just examine the main effects of privacy risks and benefits on information disclosure behavior (e.g., Xu et al., 2009; Zhao et al., 2012) but pay less attention to the interaction effect between these two factors. However, the interaction effect may better reflect the concept of trade-off. Thus, the first research objective of this study is *to investigate whether or not there is an interaction effect between privacy risks and perceived benefits*.

Second, as most of previous studies are conducted in the research context of e-commerce, these studies focused on the utilitarian benefits which are associated with productivity and efficiency issues such as personalization (e.g., Awad & Krishnan, 2006). However, in the LBSNS which facilitates the interpersonal communications, utilitarian benefits may become not so important. In contrast, hedonic benefits which stress on users' pleasure and enjoyment (Chen, 2013b; Krasnova et al., 2010) may become the dominant benefit perception. Therefore, the second research objective of this study is *to examine whether or not the benefit structure changes when the context changes from the e-commerce to the LBSNS*.

Third, besides understanding the privacy calculus and benefit structure during the information disclosure decision making in the context of LBSNS, we are also interested in the individual differences in this process. Regarding gender as the most frequently discussed individual trait in previous studies (e.g., Chai, Das, & Rao, 2011; Chen, Ma, Jin, & Fosh, 2013; Midha, 2012; Zhang, Cheung, & Lee, 2014), the third objective of this study is *to understand whether or not there are gender differences in privacy calculus and benefit structure*.

Drawing upon the privacy calculus model (Dinev & Hart, 2006a), justice theory (Colquitt, Conlon, Wesson, Porter, & Ng, 2001), self determination theory (Deci & Ryan, 1985), and social role theory (Eagly, 1987), this study attempts to address the aforementioned three issues respectively. First, privacy calculus model and justice theory posit that users make their decisions on whether or not to disclose their location information based on the trade-off between privacy risks and benefits associated with the information disclosure. Besides the main effects of privacy risks and perceived benefits, they will interactively exert their influences on information disclosure intention. Second, based on the self determination theory which classifies the human motivation into extrinsic motivation and intrinsic motivation, we propose that in the research context of LBSNS which stresses on user experience, hedonic benefits should have stronger impacts on the whole benefit perceptions than utilitarian benefits. Third, according to the social role theory which postulates that males and females show different social behaviors because of the different societal and cultural expectations for them, we propose that the benefit structure and the privacy calculus will vary across genders.

The paper is structured as follows. First, we review prior literature on privacy and information disclosure and introduce the self determination theory and the social role theory of gender. Second, we develop a research model to explain the privacy calculus, benefit structure and gender differences. Next, we describe the research methodology and discuss the data analysis results. Finally, we conclude with a discussion of the theoretical and practical implications of the study and directions for future research.

2. Theoretical development

2.1. Information disclosure and privacy calculus

Social network sites or services (SNSs) refer to a platform such as MySpace and Facebook that facilitates individuals to "construct a public or semi-public profile within a bounded system; articulate a list of other users with whom they share a connection; and view and traverse their list of connections and those made by others within the system" (Boyd & Ellison, 2007, p. 211). Since SNSs allow individuals to "*intentionally* and *voluntarily* self-disclose their personal information to others in interpersonal relationships," they are regarded as a kind of self-disclosure technology (Lowry et al., 2011, p. 164). Following the development of mobile technologies, SNSs have been extended to the mobile context and combined with the location-based services (LBS), fostering the emergence of location-based social network services (LBSNS) which enable users to share location information or location-related activities to others in their interpersonal relationships. Regarding that location-related information is more sensitive than other information (Zhao et al., 2012), encouraging users to disclose their location-related information calls for more considerations than traditional SNSs.

A key concept associated with information disclosure in extant literature is privacy (Cheung & Lee, 2006; Lowry et al., 2012; Pavlou, 2011; Shah, Peikari, & Yasin, 2014; Smith, Dinev, & Xu, 2011; Squicciarini, Xu, & Zhang, 2011; Yao, Rice, & Wallis, 2007). Privacy has been defined in many ways in previous studies. In their review of multiple definitions of privacy, Bélanger and Crossler (2011) conclude that taking privacy as *one's ability to control information about oneself* is commonly accepted. Within our research context, privacy is related to LBSNS users' ability to control their location relevant information. Correspondingly, privacy risks are related to the uncertainty caused by the possibility of the misuse of privacy information that can result in loss for the users (Dinev & Hart, 2006a).

As users have a tendency to withhold their privacy information, it requires other motivators to drive users to give up the right to keep this information. Based on the justice theory, Dinev et al. (2006) propose a privacy calculus model by arguing that the benefits brought by the information disclosure behavior may compensate for users' losses of privacy information and make them disclose the privacy information. Since then, the justice theory or the privacy calculus model has become a well established mechanism to explain the information disclosure behavior and has been widely used in previous empirical studies (e.g., Dinev et al., 2006; Dinev & Hart, 2006a; Dinev, Xu, Smith, & Hart, 2013; Xu et al., 2009; Zhao et al., 2012).

The literature review (see Appendix A) shows that information disclosure and privacy issues have been majorly investigated in two research contexts: the e-commerce context and the self-disclosure technology context. In the e-commerce context, researchers focus on the personalization – privacy paradox issue (Awad & Krishnan, 2006) which reflects users' trade-off between the personalization benefits and the risks caused by the disclosure of profile or transaction information. In contrast, in the research context of self-disclosure technologies which include a variety of social computing technologies such as blogs, microblogs, instant messaging, and social networking web sites (e.g., Facebook) (Lowry et al., 2011), privacy risks are associated with not only the service providers' information misuse behavior (e.g., the interaction between users and the Web site) but also

other users' information misuse behavior (e.g., the interactions among users) (Zhao et al., 2012). Although the impacts of privacy risks in the e-commerce context have been extensively tested, the role of privacy risks in the LBSNS still requires more empirical investigations.

The privacy calculus model has provided a sound framework to analyze the information disclosure behavior. However, there are still several research gaps to be filled. First, although the privacy calculus model has implicitly suggested that the results of trade-off between perceived benefits and privacy risks play a pivotal role, previous studies have focused on the main effects of privacy risks and perceived benefits (e.g., Dinev & Hart, 2006a; Xu et al., 2009; Zhao et al., 2012) but neglected the interaction effects between these two factors. According to the equity theory (Adams, 1963), the interactive mechanism may better reflect the truth. Second, most of previous studies are conducted in the research context of e-commerce by focusing on utilitarian benefits. However, when shifting the research context to the self-disclosure technology, the benefit structure may be changed. Third, although several previous studies have shed light on the role of individual differences in information disclosure, such as gender (e.g. Chai et al., 2011; Midha, 2012), whether or not males and females have same benefit structure and privacy calculus pattern still asks for further investigations. To fill these research gaps, we propose a research model (as shown in Fig. 1) to address the issues of privacy calculus, benefit structure, and gender differences.

According to the privacy calculus model (Dinev & Hart, 2006a), perceived benefits and privacy risks should respectively have positive and negative impacts on information disclosure intention. Specifically, when users share their location-related information with their friends in their interpersonal networks, they may get the benefits of personalization (Zhao et al., 2012) or enjoyment (Krasnova et al., 2010). These benefits will drive users to disclose their location information to obtain these benefits. On the other hand, because location-related information is more sensitive than other types of information (Zhao et al., 2012), users may be worried about their personal information to be misused by others and do not want to share the information. Thus, we propose that

H1. Perceived benefits are positively associated with intention to disclose location information.

H2. Privacy risks are negatively associated with intention to disclose location information.

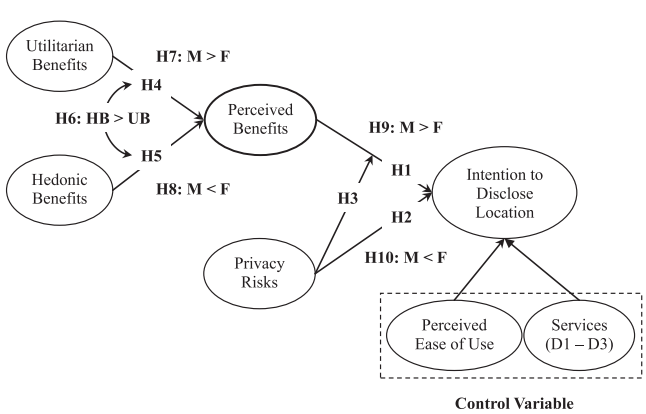

Fig. 1. Research model. Note: M = Males, F = Females, UB = Utilitarian Benefits, HB = Hedonic Benefits. Perceived benefits are taken as a second-order construct.

Further, according to the equity theory, users' justice perceptions are based on the trade-off between benefits and costs and they try to maximize the ratio of benefits and costs (Adams, 1963). Thus, perceived benefits and privacy risks may not independently influence information disclosure intention but jointly exert their impacts on intention (Au, Ngai, & Cheng, 2008). Specifically, with different levels of privacy risks, the relationship between perceived benefits and intention to disclose location information should vary. When privacy risks are relatively low, it is easier for users to feel justice when there are certain perceived benefits, suggesting a strong relationship between perceived benefits and intention. However, when privacy risks are relatively high, users may shift their attention to the risk issues. In this situation, they may consider the information disclosure behavior as unjust even though they recognize the great benefits, indicating a weak relationship between perceived benefits and intention. Therefore, we propose that

H3. Privacy risks weaken the relationship between perceived benefits and intention to disclose location information.

2.2. Perceived benefits and self determination theory

Prior literature on information disclosure has identified two types of benefits associated with the information disclosure behavior: utilitarian benefits and hedonic benefits. Utilitarian benefits are associated with the productivity and efficiency issues. For example, Xu et al. (2009) figure out that consumers can obtain personalized product recommendations by disclosing their location information to the stores or the restaurants around their locations. Unlike utilitarian benefits which are based on the instrumental view, hedonic benefits are associated with users' pleasure and enjoyment (Chen, 2013b; Krasnova et al., 2010) which is based on the interest in the action itself rather than external reinforcement (Davis, Bagozzi, & Warshaw, 1992). The information disclosure behavior may result in both utilitarian and hedonic benefits, but these two types of benefits may have different weights in terms of the specific contexts.

Self determination theory (SDT) (Ryan & Deci, 2000), which is regarded as one of the most important motivation theories, is helpful for understanding the contexts under which utilitarian or hedonic benefits play a more dominant role. SDT argues that individuals' behaviors may be driven by their own interests and values or for reasons external to the self, and then SDT classifies individual motivations into intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to "doing an activity for the inherent satisfaction of the activity itself," while extrinsic motivation refers to "the performance of an activity in order to attain some separable outcome" (Ryan & Deci, 2000, p. 71). Unlike intrinsic motivation which involves enjoyment of the activity itself, extrinsic motivation involves instrumentalities and represents intentional behavior.

Information systems research has widely taken intrinsic and extrinsic motivations as two major predictors of users' technology acceptance behavior. Davis et al. (1992) propose extrinsic motivation (e.g., perceived usefulness) and intrinsic motivation (e.g., perceived enjoyment) as two major determinants of intentions to use computers in the workplace. The role of extrinsic and intrinsic motivation in technology adoption has been re-examined in the research context of Internet (Teo, Lim, & Lai, 1999), blog (Hsu & Lin, 2008), online shopping (Shang, Chen, & Shen, 2005), knowledge sharing systems (Lin, 2007), and hedonic information systems in general (Van der Heijden, 2004). These studies address the mechanisms of intrinsic and extrinsic motivation to respectively

argue the impacts of hedonic and utilitarian benefits (Wu & Lu, 2013).

More importantly, hedonic and utilitarian benefits may have different impacts across the types of information systems. In a meta-analysis, Wu and Lu (2013) conclude that utilitarian benefits or extrinsic motivators have stronger impacts than hedonic benefits or intrinsic motivators in the context of utilitarian information systems (e.g., ERP systems, office automation applications, and Web-based banking technology) while hedonic benefits or intrinsic motivators have stronger impacts than utilitarian benefits or extrinsic motivators in the context of hedonic information systems (e.g., instant messaging, Internet Protocol Television, social networking websites, and online shopping systems). Childers, Carr, Peck, and Carson (2002) also argues that enjoyment plays a more important role than usefulness in a more hedonic environment. Because social network sites are regarded as purely hedonic platforms (Krasnova et al., 2010), hedonic benefits should be a more dominant role in the formulation process. Therefore, we propose

H4. Utilitarian benefits are positively associated with perceived benefits.

H5. Hedonic benefits are positively associated with perceived benefits.

H6. Hedonic benefits have stronger impacts on perceived benefits than utilitarian benefits.

2.3. Social role theory and gender differences

Gender's role within technology acceptance model (TAM) has been widely investigated in previous studies (e.g., Gefen & Straub, 1997; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh & Morris, 2000). Social role theory (Eagly, 1987) is taken as the theoretical foundation to explain the gender differences in behavior. Social role theory states that gender differences in behavior is mostly due to the social construction process, and using different socially-constructed structures women and men encode and process information in different patterns (Bem, 1981; Venkatesh & Morris, 2000). Despite a variety of gender differences identified in previous studies, in this study, we focus on the gender differences in the trade-off between utilitarian and hedonic benefits and between benefits and risks.

As to the trade-off between utilitarian and hedonic benefits, previous studies suggest that men may place great emphasis on work, accomplishment, and eminence and their behaviors are mainly driven by individualistic tasks and goals (Carlson, 1971). Thus, men's behaviors can be characterized as more instrumental and task-oriented than women (Taylor & Hall, 1982). In contrast, women are driven by expressive and communal goals, such as enjoyment and interpersonal harmony (Bakan, 1966; Spence & Helmreich, 1978), so they pay more attention to the activity per se rather than the external outcomes induced by the activity. It suggests that unlike men who stress on extrinsic motivators women care more about intrinsic motivators. In the research context of social networking websites, Lin and Lu (2011) also find that usefulness has stronger impact on continued intention to use social networking sites for men than for women while enjoyment has stronger impact on continued intention to use social networking sites for women than for men. Therefore, we propose that

H7. The relationship between utilitarian benefits and perceived benefits is stronger for males than for females.

H8. The relationship between hedonic benefits and perceived benefits is stronger for females than for males.

As to the trade-off between benefits and risks, social role theory indicates that men are more independent, competitive and concern more egoistic benefits than women (Deaux, 1984; Gefen & Straub, 1997), so in the benefit-risk trade-off process, men will pay more attention to perceived benefits than women. Further, Bem's (1981) Sex Role Inventory (BSRI) suggests that men tend to exhibit more masculine traits compared to women. As risk taking is regarded as a representative "attribute of the masculine psychology" (Wilson, Daly, Gordon, & Pratt, 1996, p. 66), males should have higher risk-taking tendencies than females (Byrnes, Miller, & Schafer, 1999). In the previous studies on information disclosure, Midha (2012) also highlights that males pay more attention to benefits while females care more about privacy risks. So, we propose that

H9. The relationship between perceived benefits and intention to disclose location information is stronger for males than for females.

H10. The relationship between privacy risks and intention to disclose location information is stronger for females than for males.

Besides the benefit and risk perceptions, perceived ease of use which is an important factor in technology acceptance model (TAM) (F.D. Davis, 1989) is included in the model as a control variable. As prior TAM research has figured out that perceived ease of use has stronger impacts on intention for females than for males (Venkatesh & Morris, 2000), we will revisit this argument in the context of LBSNS as well.

3. Research method

3.1. Research setting and respondents

To test the proposed hypotheses, data were collected using a survey from the LBSNS users in China. According to the report related to LBSNS, there had been more than 40 LBSNS applications with 3.3 million subscribers in China by the end of 2010 (Zhao et al., 2012), indicating that LBSNS has been prevalent in China. Thus, using Chinese respondents to examine the issue of information disclosure in LBSNS should be appropriate. Further, most of previous studies on information disclosure were conducted in other countries such as the United States of America (e.g., Dinev et al., 2006; Dinev & Hart, 2006a; Xu et al., 2009), so our studies can provide some empirical evidences about the applicability of privacy calculus model in China.

To obtain adequate variances for the variables in the research model, we did not designate a specific LBSNS in the survey but asked the respondents to choose one LBSNS which was most frequently used by them. As respondents may have different preferences to LBSNSs, they would express their perceptions about the benefits, privacy risks and disclosure intention based on different LBSNSs. In this way, the variables in the model could have sufficient variances enabling us to more accurately capture their impacts (Zhao et al., 2012). Further, to remove the bias induced by the service selection, we used

several dummy variables that reflected the different LBSNS as control variables of the model.

Further, students in university were selected as the target population because they were the major LBSNS users in China. According to the CNNIC (China Internet Network Information Center) 2012 report, 43.1% of LBSNS users were with the age ranged from 20 to 29 and about one among five undergraduates used LBSNS with the ratio significantly higher than other populations. Therefore, using student sample was appropriate for the current study.

3.2. Measures

All the measures were adapted from previous studies and had been proven to be reliable and valid. Seven-point Likert scales anchored with "strongly disagree" to "strongly agree" were used for multiple items of all latent constructs. Specifically, perceived benefits were taken as a second-order construct with two dimensions namely utilitarian benefits and hedonic benefits. They were respectively measured using the items of perceived usefulness adapted from Zhou (2013) and perceived enjoyment adapted from Venkatesh (2000). Privacy risks were measured with the items adapted from Zhou (2013) and intention to disclose location information was measured with three items adapted from Xu et al. (2009). Besides these factors, we also took perceived ease of use as a control variable because it was regarded as an important predictor in technology acceptance literature (Venkatesh, Thong, & Xu, 2012). The measures for perceived ease of use were adapted from Xu and Gupta (2009). The constructs and measures were specified in Table 1. Because the original items were in English, we asked four undergraduates to help convert these items into Chinese using the back translation approach.

Table 1
Constructs and measures.

Constructs	Items	Sources
Location-based services (LBS) refer to one type of information services which enables the service providers to capture users' location information and provide users with location-related services. It includes a variety of applications such as Jiepang, Dianping, Baidu Shenbian and others. Please select one LBS which you most frequently use and answer the following questions according to your opinions about the selected LBS. Please indicate the extent to which you agree with the following statements where "1" denotes "strongly disagree" and "7" denotes "strongly agree."		
Utilitarian benefits	UB1: Disclosing my location information via LBSNS can improve my living and working efficiency UB2: Disclosing my location information via LBSNS can improve my living and working effectiveness UB3: I feel that disclosing my location information via LBSNS is useful	Zhou (2013)
Hedonic benefits	HB1: I find disclosing my location information via LBSNS to be enjoyable HB2: The actual process of disclosing my location information via LBSNS is pleasant HB3: I have fun disclosing my location information via LBSNS	Venkatesh (2000)
Privacy risks	PR1: Disclosing my location information to this service provider may bring many unpredicted problems PR2: Disclosing my location information to this service provider is risky PR3: Disclosing my location information to this service provider may bring potential losses	Zhou (2013)
Intention to disclose	Specify the extent to which you would reveal your location information: INTD1: Willing/unwilling INTD2: Unlikely/likely INTD3: Not probable/probable	Xu et al. (2009)
Perceived ease of use	PEOU1: My interaction with the LBSNS would be clear and understandable PEOU2: I would find the LBSNS easy to use PEOU3: Learning to use LBSNS is easy for me	Xu and Gupta (2009)

3.3. Data collection procedure

The questionnaires were distributed to the users of LBSNS in China through the snowballing method. Initially, we introduced the survey on a methodology course for undergraduate students and invited students to participate in the survey voluntarily. For each student who expressed his/her willingness to participate in the survey, an email with a brief instruction of the survey and an URL link which could direct him/her to the online survey website was sent. We also encouraged the students who completed the survey to forward the URL link of the survey to their LBSNS friends, and their friends could further forward the URL link to others. To ensure the validity of the answers, respondents were asked to express their actual perceptions about the questions and were informed that only the statistic data would be used in the analysis so their personal information would not be disclosed to public. Finally, 164 validated questionnaires were obtained and used in the data analysis. The demographic statistics for the respondents were reported in Table 2. Among these respondents, 39.6% of the respondents were males. Further, 67.1% of the respondents were in the 21–25 age range, and 84.8% of the respondents were with the education level of bachelor or above. Nearly 90% of the respondents had more than four years of experience in Internet and more than 60% of the respondents had more than six months of experience in LBS usage.

It was worth noting that three specific LBSNS services namely Dianping, Jiepang and Baidu Shenbian were widely used by the respondents. Dianping is a platform for users to share their

Table 2
Demographic statistics.

Variables	Levels	Frequency	Percentage (%)
Gender	Male	65	39.6
	Female	99	60.4
Age	<=20	39	23.8
	21–25	110	67.1
	26–30	14	8.5
	>30	1	0.6
Education	High school or below	11	6.7
	Two year college	14	8.5
	Bachelor	120	73.2
	Master or above	19	11.6
Internet usage experience	<2 years	3	1.8
	2–3 years	14	8.5
	4–5 years	34	20.7
	6–7 years	43	26.2
	>=8 years	70	42.7
LBS usage experience	<3 months	48	29.3
	3–6 months	17	10.4
	7–12 months	18	11.0
	12–24 months	37	22.6
	>24 months	44	26.8
Services	Dianping	64	39.0
	Jiepang	46	28.0
	Baidu Shenbian	20	12.2
	Others	34	20.8

opinions (e.g., online review) about restaurants and other service vendors through their social networks and users can obtain recommendations based on their locations. Jiepang and Baidu Shenbian are very similar to Foursquare in USA. Both of these two LBSNSs allow users to share their locations and location-relevant activities (e.g., having dinner and entertainment) with their friends in their social networks. For other LBSNS services whose frequency was less than ten, we used "others" to reflect them so as to simplify the discussion. Therefore, three dummy variables were used to capture these four levels of services.

4. Data analysis

Partial least squares (PLS) was used in the data analysis. PLS, as a second-generation statistic or structural equation modeling (SEM) approach, can estimate the measurement model and structural model simultaneously and systematically. Further, compared to covariance-based SEM approach, PLS is more appropriate to deal with small sample size and formative measures (Hair, Ringle, & Sarstedt, 2011). In our study, given the relative small sample size and formative nature of perceived benefits, PLS was used in the analysis. Specifically, SmartPLS was used as the analytic tool.

4.1. Measurement model

All the first-order constructs were reflectively measured, so the measurement model for the first-order constructs was assessed by examining their reliabilities, convergent and discriminant validities. The reliability of a construct can be assessed by checking its composite reliability and average variance extracted (AVE) (Fornell & Larcker, 1981). As shown in Table 3, the composite reliabilities for all the constructs were greater than 0.8 and the AVEs were greater than 0.6, exceeding the suggested threshold values of 0.7 and 0.5 respectively (Fornell & Larcker, 1981). Therefore, all of these constructs were with appropriate reliabilities.

Consistency validity can be assessed by checking whether or not the item loadings on their respective constructs were high enough while discriminant validity can be assessed by checking whether or not the item loadings on their respective constructs were higher than the loadings on other constructs (e.g., cross-loadings). As shown in Table 4, the item loadings on their respective constructs were higher than 0.7 and these loadings were higher than cross-loadings too, suggesting that these constructs had adequate convergent and discriminant validities.

Another approach to evaluate the discriminant validity is to compare the square root of AVE for a construct and the correlation coefficients related to this construct. As shown in Table 3, the square roots of AVE for all the constructs were greater than the correlation coefficients, confirming that these constructs were with good discriminant validity (Bock, Zmud, Kim, & Lee, 2005).

Table 4
Loadings and cross-loadings.

	INTD	HB	UB	PR	PEOU
INTD1	**0.899**	0.402	0.295	−0.281	0.257
INTD2	**0.887**	0.519	0.420	0.009	0.450
HB1	0.470	**0.919**	0.613	0.341	0.692
HB2	0.478	**0.933**	0.628	0.312	0.640
HB3	0.469	**0.907**	0.587	0.295	0.552
UB1	0.370	0.626	**0.911**	0.328	0.519
UB2	0.369	0.589	**0.916**	0.347	0.488
UB3	0.340	0.582	**0.887**	0.382	0.486
PR1	−0.172	0.301	0.368	**0.932**	0.363
PR2	−0.142	0.321	0.362	**0.935**	0.368
PR3	−0.094	0.329	0.320	**0.853**	0.395
PEOU1	0.352	0.557	0.453	0.277	**0.788**
PEOU2	0.350	0.575	0.448	0.298	**0.850**
PEOU3	0.214	0.517	0.434	0.472	**0.789**

Table 5
Weights of perceived benefits.

	Weights	*t*-Statistics
Utilitarian benefits	.197*	2.056
Hedonic benefits	.859**	9.503

Note: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 6
Common method bias test.

Construct	Indicator	Substantive factor loading (R_1)	R_1^2	Method factor loading (R_1)	R_2^2
Intention to disclose	INTD1	0.961	0.924	−0.143	0.020
	INTD2	0.829	0.687	0.137	0.019
Utilitarian benefits	UB1	0.830	0.689	−0.038	0.001
	UB2	0.958	0.918	−0.039	0.002
	UB3	0.927	0.859	0.079	0.006
Hedonic benefits	HB1	0.881	0.776	0.226	0.051
	HB2	0.907	0.823	−0.031	0.001
	HB3	0.973	0.947	−0.198	0.039
Privacy risks	PR1	0.907	0.823	−0.007	0.000
	PR2	0.940	0.884	−0.008	0.000
	PR3	0.882	0.778	0.015	0.000
Perceived ease of use	PEOU1	0.600	0.360	0.152	0.023
	PEOU2	0.909	0.826	−0.064	0.004
	PEOU3	0.912	0.832	−0.068	0.005
Average		0.887	0.795	0.001	0.012

In order to compare the weights of utilitarian benefits and hedonic benefits across different groups, we included both the two first-order constructs (e.g., utilitarian benefits and hedonic

Table 3
Descriptive statistics, reliabilities, and correlations.

	Mean	SD	AVE	CR	INTD	HB	UB	PR	PEOU
INTD	3.829	1.419	0.798	0.887	**0.893**				
HB	4.797	1.187	0.846	0.943	0.514	**0.920**			
UB	4.913	1.142	0.818	0.931	0.398	0.663	**0.905**		
PR	5.258	1.265	0.823	0.933	−0.157	0.344	0.388	**0.907**	
PEOU	4.854	1.100	0.656	0.851	0.393	0.683	0.550	0.407	**0.810**

Note: AVE = Average variance extracted, CR = Composite reliability, INTD = Intention to disclose, HB = Hedonic benefits, UB = Utilitarian benefits, PR = Privacy risks, PEOU = Perceived ease of use. Boldfaced diagonal elements are the square roots of AVEs.

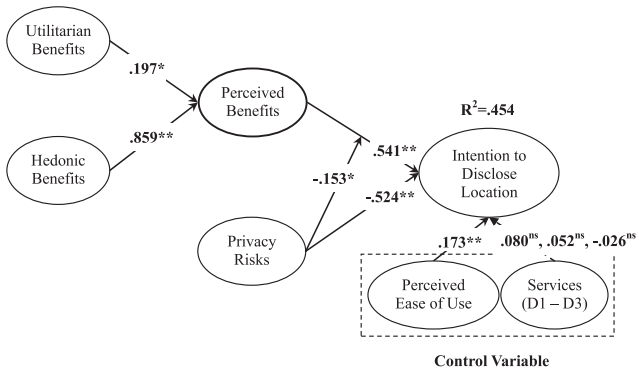

Fig. 2. PLS results (overall sample).

benefits) and the second-order construct perceived benefits in the model, as operated by Bock et al. (2005). Specifically, the factor scores for the two first-order constructs were taken as the items of the second-order construct. As shown in Table 5, the weights for both utilitarian and hedonic benefits were significant.

Further, as all the constructs were measured subjectively from same sources at the same time, there may be potential common method bias. Thus, according to Podsakoff et al.'s (2003) suggestions, we compared the variances explained by both the trait factors (or substantive factors) and a method factor. Specifically, with the guideline of Liang, Saraf, Hu, and Xue (2007), we found that the substantive factors explained nearly 80% of the total variances while the method factor only explained 1.2% of the variances (see Table 6), suggesting that common method bias was not a serious concern in our study. Finally, as the correlations between constructs were relatively high, a multicollinearity problem could exist. However, the regression analysis results showed that the variance inflation factor (VIF) values for all of the constructs were between 1.284 and 2.375, less than the suggested threshold value 3.3 (Petter, Straub, & Rai, 2007).

Table 7
Comparison between utilitarian and hedonic benefits.

	Utilitarian benefits (UB)	Hedonic benefits (HB)	$\Delta\beta$	$t_{spooled}$	Conclusion
Overall	.197*	.859**	.662	73.451	HB > UB
Males	.424**	.656**	.232	33.059	HB > UB
Females	.252**	.823**	.571	47.479	HB > UB

Note: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 9
Direct effects of utilitarian and hedonic benefits.

	Male	Female	$\Delta\beta$	$t_{spooled}$	Conclusion
UB → INTD	.341**	.089	.252	37.546	Male > Female
HB → INTD	.526**	.324**	.202	25.491	Male > Female

Note: UB = Utilitarian benefits, INTD = Intention to disclose, HB = Hedonic benefits.
Note: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

4.2. Structural model

PLS results of the structural model were shown in Fig. 2. The results showed that perceived benefits had significant positive impact on disclosure intention ($\beta = .541$, $t = 7.763$) while privacy risks had significant negative impact on disclosure intention ($\beta = -.524$, $t = 4.985$), lending supports to H1 and H2. According to the multiplicative approach suggested by Chin, Marcolin, and Newsted (2003), the interaction effect between perceived benefits and privacy risks was found to be significant ($\beta = -.153$, $t = 1.996$), supporting H3. Both utilitarian and hedonic benefits were found to have significant impacts on perceived benefits ($\beta = .197$, $t = 2.056$; $\beta = .859$, $t = 9.503$ respectively), supporting H4 and H5. Besides, the control variable perceived ease of use was found to have significant impacts on disclosure intention ($\beta = .173$, $t = 2.098$). The three dummy variables denoting different services were found to have insignificant impacts on disclosure intention ($\beta = .080$, $t = 1.084$; $\beta = .052$, $t = 0.831$; $\beta = -.026$, $t = 0.462$, respectively).

We further compared the impacts of utilitarian and hedonic benefits on perceived benefits according to Keil et al.'s (2000) method which was suggested by Huang, Davison, and Gu (2011) and found that hedonic benefits had stronger impacts on perceived benefits than utilitarian benefits for the overall sample and the two sub-samples (e.g., male and female sub-samples) (see Table 7). Therefore, H7 was supported.

According to the approach proposed by Keil et al. (2000), we compared the path coefficients across genders. The results (see Table 8) showed that the relationship between perceived benefits and intention was stronger for males than for females ($\Delta\beta = .413$, $t_{spooled} = 55.626$) while the relationship between privacy risks and intention was stronger for females than for males ($\Delta\beta = .214$, $t_{spooled} = 31.757$), supporting H7 and H8. Utilitarian benefits were found to have stronger impact on perceived benefits for males than for females ($\Delta\beta = .172$, $t_{spooled} = 10.404$), while hedonic benefits were found to have stronger impact on perceived benefits for females than for males ($\Delta\beta = .167$, $t_{spooled} = 12.672$), so H9 and H10 were supported. Further, we also compared the impacts of perceived ease of use on intention and found that its impact was stronger for females than for males

Table 8
Comparison between males and females.

	Male ($N_1 = 65$)	Female ($N_2 = 99$)	$\Delta\beta$	$t_{spooled}$	Hypothesis support
H7: PB → INTD	.799**	.386**	.413	55.626	Support (M > F)
H8: PR → INTD	−.295**	−.509**	.214	31.757	Support (M < F)
H9: UB → PB	.424**	.252*	.172	10.404	Support (M > F)
H10: HB → PB	.656**	.823**	.167	12.672	Support (M < F)
PEOU → INTD	.058	.250**	.192	24.850	Significant (M < F)

Note: PB = Perceived benefits, INTD = Intention to disclose, PR = Privacy risks, UB = Utilitarian benefits, HB = Hedonic benefits, PEOU = Perceived ease of use. The path coefficients were compared using the method proposed by Keil et al. (2000): $S_{pooled} = \sqrt{\{[(N_1-1)/(N_1+N_2-2)] \times SE_1^2 + [(N_2-1)/(N_1+N_2-2)] \times SE_2^2\}}$ $t = (PC_1 - PC_2)/[S_{pooled} \times \sqrt{(1/N_1 + 1/N_2)}]$ Where S_{pooled} = pooled estimator for the variance, t = t-statistic with $N_1 + N_2 - 2$ degrees of freedom, N_i = sample size of dataset for group i, SE_i = standard error of path in structural model of group i, PC_i = path coefficient in structural model of group i.
Note: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

($\Delta\beta$ = .192, $t_{spooled}$ = 24.850), consistent with previous literature (Venkatesh et al., 2003).

4.3. Post-hoc analysis

In the data analysis, we treated perceived benefits as a second-order construct with two dimensions utilitarian and hedonic benefits and tested the impact of perceived benefits on intention. In this post hoc analysis, we tended to analyze the direct effects of utilitarian and hedonic benefits. As shown in Table 9, both utilitarian and hedonic benefits were found to have stronger impacts on intention for males than for females ($\Delta\beta$ = .252, $t_{spooled}$ = 37.546; $\Delta\beta$ = .202, $t_{spooled}$ = 25.491 respectively), consistent with the findings of Venkatesh et al.'s (2012) study on consumer acceptance of hedonic technology.

By comparing the results of the post hoc analysis and the results in data analysis section, we found that utilitarian and hedonic benefits can exert their influences on intention through two stages. The first stage is the benefit formulation stage at which individuals form their overall perceptions about benefits by balancing utilitarian and hedonic benefits. The second stage is the privacy calculus stage where individuals balance benefits and privacy risks. As found in the data analysis section, utilitarian benefits have stronger impacts at both the benefit formulation stage and the privacy calculus for males than for females, so utilitarian benefits will have stronger impact on intention for males than for females. In contrast, hedonic benefits have stronger impacts at the benefit formulation stage for females than for males while benefits have weaker impacts at the privacy calculus stage for females than for males. Because the gender differences at the privacy calculus stage were much stronger than at the benefit formulation stage, hedonic benefits were found to have stronger impacts on intention for males than for females.

5. Discussions and implications

5.1. Discussion of findings

The study attempts to understand the benefit structure, privacy calculus and gender differences in the context of location-based social network services (LBSNS). Several key findings can be derived from the study. First, as to the benefit structure, this study finds that in the context of LBSNS which is most frequently regarded as a hedonic technology (Krasnova et al., 2010), hedonic benefits become the most salient component of the overall benefit perceptions. This is different from the previous studies which have been majorly conducted in a more utilitarian oriented context such as e-commerce (Xu et al., 2009) where utilitarian benefits are the research focus. Second, as to the privacy calculus, this study has proposed and empirically tested the interaction effect between perceived benefits and privacy risks and find that privacy risks weaken the relationship between perceived benefits and disclosure intention, indicating that when privacy risks are high, users would not like to disclose their location information even though they recognize that information disclosure can bring them a variety of benefits. Third, as to gender differences, this study finds that males and females think differently at both the benefit formulation stage and the privacy calculus stage. Specifically, the results show that females pay more attention to hedonic benefits than males while males pay more attention to utilitarian benefits than females. The results also suggest that when balancing benefits and risks males rely heavily on benefits while females on risks.

5.2. Theoretical contributions

This study can contribute to privacy and social media literature in several ways. First, this study advances the understanding on privacy calculus model by taking the interaction effect between perceived benefits and privacy risks into account. Previous studies draw upon the privacy calculus model to explain the information disclosure behavior by only considering the main effects of benefits and privacy risks (e.g., Xu et al., 2009). However, this theorization cannot well capture the concept of the trade-off between benefits and risks because a trade-off can be achieved only when two things are jointly considered. Thus, beyond their independent main effects, we propose there is an interaction effect between perceived benefits and privacy risks and the results do confirm the validity of this theorization. This interaction effect indicates the boundary conditions under which privacy risks and perceived benefits work. Specifically, the study shows that the relationship between perceived benefits and behavioral intention will be stronger when privacy risks are low.

Second, this study extends the privacy calculus model from the utilitarian technology context to the hedonic technology context, proposes and empirically examines the change in benefit structure due to the contextual differences. Most of previous studies on privacy and information disclosure are conducted in the utilitarian technology context and focus on the utilitarian benefits (e.g., Xu et al., 2009). Some studies investigating this issue in the hedonic technology context (e.g., Zhao et al., 2012) but have not compared the impacts of utilitarian benefits and hedonic benefits. In this study, considering the contextual differences, we explicitly propose that hedonic benefits will play a more important role in the LBSNS context and empirically test this difference. The findings suggest future researchers to pay attention to the contextual differences and develop context-specific models based on these differences.

Third, this study examines the gender differences in location information disclosure at both the benefit formulation stage and the privacy calculus stage. The gender differences in the information disclosure behavior have been rarely investigated. Even though some studies may explore the moderating role of gender in understanding the impacts of benefit perceptions on behavioral intentions (Midha, 2012), they have not differentiated the decision making stages. In this way, it is difficult for researchers to identify the actual sources of gender differences. For example, previous studies on the moderating role of gender in the technology acceptance literature may lead to different conclusions. Several studies argue that hedonic benefits have stronger impacts on behavioral intention for females than for males (Nysveen, Pedersen, & Thorbjørnsen, 2005) while others state that the relationship between hedonic benefits and intention is stronger for males than for females (Venkatesh et al., 2012). To solve the inconsistency, we propose a two-stage model by stating that males and females may think differently at the benefit formulation stage and the privacy calculus stage. Our results show that females stress more on hedonic benefits at the benefit formulation stage while they underestimate the importance of benefits at the privacy calculus stage. Thus, a better understanding on the impacts of hedonic benefits on intention requires distinguishing the benefit formulation stage from the privacy calculus stage.

Fourth, this study extends the technology acceptance model (TAM) and self determination theory (SDT) to the research context of LBSNS and provides some context-specific theoretical implications. Specifically, the results of this study suggest that for LBSNS which is a hedonic technology (Van der Heijden, 2004; Venkatesh et al., 2012), perceived enjoyment has a stronger impact on user behavior than perceived usefulness and perceived ease of use which are considered key predictors for utilitarian technologies (Davis, 1989; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Further, based on SDT (Ryan & Deci, 2000), we figured out that perceived usefulness (e.g., utilitarian benefits) and perceived enjoyment (e.g., hedonic benefits) exerted their impacts through the mechanisms of extrinsic and intrinsic motivations. We further highlighted that these two motivations worked in different contexts. Specifically, females stress more on intrinsic motivations than on extrinsic motivation, while males emphasize more on extrinsic motivations than on intrinsic motivations. Thus, our study advances SDT by pointing out the contingent factors (e.g., gender) that determine the conditions under which different motivation mechanisms are triggered.

5.3. Practical implications

This study yields several important implications for practice regarding how to increase users' information disclosure behavior in LBSNS by considering the benefit structure and individual differences. First, service providers should recognize that utilitarian benefits and hedonic benefits have different weights in different research contexts (e.g., e-commerce vs. social networking). Unlike utilitarian benefits which are regarded as the most important factor in the e-commerce context, in the social networking context, hedonic benefits play a much stronger role. Therefore, LBSNS service providers should pay more attention to the approach that can improve the hedonic benefits created by their LBS services.

Second, LBSNS service providers should consider the individual differences when providing their services. This study indicates that males and females focus on different factors at both the benefit formulation stage and the privacy calculus stage. Thus, service providers should recognize these differences and provide personalized services to satisfy their needs. Specifically, for females who are concerned about the privacy risks, LBSNS service providers should provide them with more functions related to the privacy control. Further, LBSNS service providers can provide the services with more hedonic benefits for females and provide the services with more utilitarian benefits for males to meet their preferences.

5.4. Limitations and future research

The study also suffers several limitations which should be considered in future research. First, to examine the location information disclosure behavior, we used the snowballing approach to recruit respondents and most of these respondents were students. Thus, whether or not the findings can be applied to other populations such as professionals still needs to be examined in future research. Second, the study was conducted in China which is a country with a collectivism and femininity culture (Hofstede, 1991), so the respondents in our study may pay more attention to the social relationships and hedonic benefits. However, whether or not the findings are applicable in other countries (e.g., USA which is a country with an individualism and masculinity culture) still needs to be examined in future research. Specifically, a cross-culture study may help to further validate our proposed model or improve our model by considering cultural moderators. Third, to investigate the benefit structure, privacy calculus and gender differences, we focus on the role of perceived benefits and privacy risks in shaping users' information disclosure intention. However, there may be other important factors which need to be included in the analysis to provide a more comprehensive picture about this issue. Finally, during the data collection process, we did not focus on one specific LBSNS but let the respondents select one LBSNS which was most frequently used by them. Although this approach is helpful for enlarging the variances of constructs, it raises the concerns about whether or not the functionality differences across different LBSNSs affect the validity of the model. Future research can further classify LBSNS into different categories and empirically examine whether or not the proposed relationships in our study are moderated by the functionality differences.

6. Conclusion

Privacy calculus model has been recognized as the most important theory to understand the information disclosure behavior. However, most of previous studies are conducted in the context of e-commerce and pay less attention to interaction effects and individual differences. To fill these gaps, this study investigates the benefit structure, privacy calculus and gender differences in the context of LBSNS. The results show that hedonic benefits rather than utilitarian benefits become the major component of benefit perceptions and privacy risks weaken the relationship between perceived benefits and information disclosure intention. The analysis also indicates that there are gender differences at both the benefit formulation stage and the privacy calculus stage. These findings have strong theoretical implications for understanding the information disclosure behavior in LBSNS and help practitioners to develop strategies to facilitate users' information disclosure behaviors.

Acknowledgements

The work described in this paper was partially supported by the grants from the National Natural Science Foundation of China (Project No. 71201118), the Fundamental Research Funds for the Central Universities (Project No. 410500133, 410500034), and Wuhan University Academic Development Plan for Scholars after 1970s ("Research on Internet User Behavior").

Appendix A. Literature review on information disclosure and privacy

Literature	Context	Independent variables	Dependent variables	Interaction effects	Theory
Anderson and Agarwal (2011)	e-health	• Privacy concern (PC) • Trust (TR) • Health status emotion (HSE)	• Willingness to provide access to personal health information (WTP)	• Type × PC → WTP • Type × TR → WTP • Purpose × PC → WTP • Purpose × TR → WTP • Stakeholder × PC → WTP • Stakeholder × TR → WTP	• Privacy boundary theory • Risk-as-feelings
Angst and Agarwal (2009)	e-health	• Argument frame (AF) • Ability (AB) • Issue involvement (II) • Concern for information privacy (CFIP) • Pre-attitude (PRA)	• Post-attitude (POA) • Opt-in intention (OII)	• II × AF → POA • CFIP × AF → POA • CFIP × II → POA • CFIP × II × AF → POA	• Elaboration likelihood model
Awad and Krishnan (2006)	e-commerce	• Gender, education, income • Previous online privacy invasion • Privacy concern • Importance of privacy policies	• Importance of information transparency • Willing to be profiled online for personalized services / personalized advertising	• NA	• Utility maximization theory
Bansal, Zahedi, and Gefen (2010)	e-health	• Health information privacy concern	• Trust • Intention to disclose health information	• NA	• Utility theory • Privacy calculus • Trust theory
Chai et al. (2011)	Knowledge sharing in blogs	• Trust (TR) • Reciprocity (REC) • Social ties (ST)	• Information privacy concerns (IPC) • Knowledge sharing behaviors (KSB)	• Gender × IPC → KSB • Gender × TR → KSB • Gender × REC → KSB • Gender × ST → KSB	• Social capital theory • Social role theory
Chakraborty, Vishik, and Rao (2013)	Online social networks	• Age • Gender	• Privacy preserving behavior	• NA	• Social role theory
Chen (2013a)	Online social networks	• Extroversion • Perceived critical mass • Perceived internet risk	• Attitude • Privacy self disclosure behaviors	• Privacy value × Attitude → Privacy self disclosure behaviors	• Theory of information disclosure behavior
Chen (2013b)	Online social networks	• Social presence • Ease of use • Internet risk perception • Privacy abuse concern	• Enjoyment • Risk • Site use	• Risk × Enjoyment → Site use	• Social exchange theory
Cheung and Lee (2006)	e-commerce	• Perceived integrity • Perceived competence • Perceived security control • Perceived privacy control • Propensity to trust • Third party recognition • Legal framework	• Consumer trust in Internet shopping	• NA	• Trust theory
Dinev and Hart (2006a)	e-commerce	• Perceived Internet privacy risk • Personal internet Interest	• Internet privacy concern • Internet trust • Willingness to provide personal information	• NA	• Privacy calculus • Expectancy theory
Dinev and Hart (2006b)	e-commerce	• Internet literacy • Social awareness	• Privacy concern • Intention to transact	• NA	• Privacy calculus
Dinev et al. (2006)	e-commerce	• Propensity to trust (PT) • Perceived risk (PR)	• Privacy concern (PC) • Institutional trust (IT) • E-commerce use (EU)	• Culture × PR → IT • Culture × PR → PC • Culture × PR → EU • Culture × IT → EU • Culture × PC → EU	• Hofstede's cultural theory • Fukuyama's theory of trust and social capital
Dinev, Hart, and Mullen (2008)	e-commerce	• Government intrusion	• Internet privacy concerns	• NA	• Asymmetric information theory

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Appendix A (*continued*)

Literature	Context	Independent variables	Dependent variables	Interaction effects	Theory
Dinev et al. (2013)	Web 2.0	• Perceived need for government surveillance • Anonymity • Secrecy • Confidentiality • Perceived benefits • Information sensitivity • Importance of information transparency • Regulatory expectations	• Willingness to provide personal information • Perceived information control • Perceived risk • Perceived privacy	• NA	• Privacy calculus • Identity management theory
Ho and Chau (2013)	Location-based commerce	• Perceived location accuracy (PLA) • Perceived location precision (PLP)	• Integrity trust in a merchant (IT) • Integrity distrust in a merchant (IDT) • Intention to use the service (INT)	• Privacy concerns × PLA → IDT • Privacy concerns × PLP → IDT	• Trust theory
Hui, Teo, and Lee (2007)	e-commerce	• Privacy statements vs. Privacy seals • Monetary incentive • Information request	• Disclosure	• NA	• Contemporary choice theory
Jiang, Heng, and Choi (2013)	Online chat rooms	• Perceived anonymity of self • Perceived anonymity of others • Perceived media richness • Perceived intrusiveness	• Privacy concerns • Social rewards • Self disclosure • Misrepresentation	• NA	• Media richness theory • Privacy calculus
Junglas, Johnson, and Spitzmüller (2008)	Location-based commerce	• Agreeableness • Conscientiousness • Emotional stability • Extroversion • Openness to experience	• Concern for privacy	• NA	• Protection motivation theory • Big five
Kim (2008)	e-commerce	• Security protection (SP) • Privacy concern (PC) • System availability (SA) • Third-party seal (TPS) • Referral (RF)	• Trust in e-vendor (TR) • Willingness to use (WTU)	• Culture × SP → TR • Culture × PC → TR • Culture × SA → TR • Culture × TPS → TR • Culture × RF → TR	• Culture theory • Theory of reasoned action
Krasnova et al. (2010)	Online social networks	• Perceived control • Convenience • Relationship building • Self-presentation • Enjoyment	• Trust in other members • Trust in provider • Perceived privacy risk • Self disclosure	• NA	• Privacy calculus
Ku, Chen, and Zhang (2013)	Online social networks	• Privacy concern (PC) • Perceived critical mass (PCM) • Subjective norm (SN)	• Gratifications (GR) • Continuance intention (CI)	• Region × GR → CI • Region × PC → CI • PC × GR → CI • Region × PC × GR → CI	• Use and gratifications theory • Social exchange theory
Li, Sarathy, and Xu (2011)	e-commerce	• Emotions (joy, fear) • Fairness levers (perceived relevance of information, awareness of privacy statement) • General privacy concern	• Privacy protection belief • Privacy risk belief • Intention to disclose information	• NA	• Privacy calculus • Theory of reasoned action
Li, Gupta, Zhang, and Sarathy (2014)	e-health	• Perceived privacy control • Trust belief • General privacy concern	• Perceived benefit • Perceived privacy risk • Intention to use health record system	• Previous privacy invasion × Perceived privacy control → Perceived privacy risk	• Justice theory • Social contract theory
Liu, Marchewka, Lu, and Yu (2004)	e-commerce	• Privacy	• Trust • Intention	• NA	• Theory of reasoned action • Trust theory
Lowry et al. (2011)	Instant messaging technology (self-disclosure technology)	• Masculinity (MAS) • Uncertainty avoidance (UA) • Power distance (PD) • Collectivism (CO)	• Information privacy concerns (IPC) • Desire for online interpersonal awareness (DOA) • Attitude (ATD)	• Culture × MAS → IPC, DOA • Culture × PD → IPC, DOA • Culture × UA → IPC, DOA • Culture × CO → IPC, DOA • Culture × IPC → ATD	• Social exchange theory • Theory of reasoned action • Culture theory

			• Intention (INT) • Use of technology (USE)	• Culture × DOA → ATD • Culture × ATD → INT • Culture × INT → USE	
Lowry et al. (2012)	e-commerce	• Understanding privacy seals • Sense of privacy seal assurance • Perceived transaction risk • Negative media coverage • Privacy victim • Brand image • Perceived website quality • Presence of privacy assurance statements • Presence of privacy seals (PPS)	• Perceived privacy assurance (PPA) • Behavioral intention toward website	• Understanding privacy seals × PPS → PPA • Sense of privacy seal assurance × PPS → PPA	• Elaboration likelihood model
Luo and Seyedian (2003)	e-commerce	• Contextual marketing (CM) • Customer orientation (CO)	• Site value (SV) • Satisfaction with site (SAT)	• Site complexity • Privacy concerns × CM → SAT • Privacy concerns × CO → SAT • Site complexity × CM → SAT • Site complexity × CO → SAT	• Theory of contextual marketing • Theory of real-time marketing • Theory of customization • Exchange theory
Malhotra, Kim, and Agarwal (2004)	e-commerce	• Internet user information privacy concern • Information sensitivity	• Trusting beliefs • Risk beliefs • Behavioral intention	• NA	• Social contract theory
Midha (2012)	e-commerce	• Privacy concern (PC) • Consumer privacy empowerment (EMP)	• Trust (TR)	• Gender × EMP → PC • Gender × PC → TR • Gender × EMP → TR	• Social constructionist theory
Posey, Lowry, Roberts, and Ellis (2010)	Professional online community	• Social influence • Social benefits (reciprocity) • Online community trust • Privacy risk • Anonymity • Collectivism • Individualism	• Self disclosure	• NA	• Social exchange theory • Social penetration theory • Cross-cultural theory
Premazzi et al. (2010)	e-commerce	• Initial trust (IT) • Monetary compensation (MC)	• Willingness to provide information (WPI) • Behavioral information disclosure (BID)	• MC × IT → WPI • MC × IT → BID	• Social exchange theory
Sheng, Nah, and Siau (2008)	m-commerce	• Personalization (PSN)	• Privacy concerns (PC) • Intention to adopt (INT)	• Context emergency (CE) × PSN → PC • CE × PSN → INT	• Expectancy theory
Squicciarini et al. (2011)	Online social networks	• Privacy concerns • Ease of use	• Usefulness • Likeability • Intention to adopt Collaborative Privacy Management (CoPE)	• NA	• Technology acceptance model
Son and Kim (2008)	e-commerce	• Information privacy concerns • Perceived justice • Societal benefits form complaining	• Refusal • Misrepresentation • Removal • Negative word of mouth • Complaining directly to online companies • Complaining indirectly to third party organizations	• NA	• Justice theory • Social exchange theory
Suh and Han (2003)	e-commerce	• Authentication • Nonrepudiation • Confidentiality • Privacy protection • Data integrity	• Trust • Attitude toward using • Behavioral intention • Actual use	• NA	• Theory of reasoned action • Trust theory
Tsai, Egelman, Cranor, and Acquisti (2011)	e-commerce	• Privacy information indicator • Prominent privacy information	• Purchase	• NA	• Microeconomic theory

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Appendix A (*continued*)

Literature	Context	Independent variables	Dependent variables	Interaction effects	Theory
Van Slyke, Shim, Johnson, and Jiang (2006)	e-commerce	• Concern for information privacy (CFIP) • Familiarity (FM)	• Trust • Risk • Willingness to transact	• FM × CFIP → Trust • FM × CFIP → Risk	• Trust theory
Wakefield (2013)	e-commerce	• Internet security • Positive affect • Negative affect	• Website trust • Website privacy • Intentions to disclose	• Internet security	• Cognitive consistency theory
Xu and Gupta (2009)	Location-based commerce	• Privacy concerns • Effort	• Performance expectancy • Intention to use LBS	• Personal innovativeness × Privacy concerns → Intention to use LBS	• Unified theory of acceptance and use of technology
Xu et al. (2009)	Location-based commerce	• Compensation (COM) • Industry self regulation (SR) • Government regulation (GR)	• Disclosure privacy benefits (DPB) • Disclosure privacy risks (DPR) • Intention to disclose personal information in LBS (INT)	• Information delivery mechanisms (IDM) × COM → DPB • IDM × SR → DPR • IDM × GR → DPR	• Justice theory • Privacy calculus
Xu, Dinev, Smith, and Hart (2011)	e-commerce	• Perceived effectiveness of privacy policy • Perceived effectiveness of industry self regulation • Disposition to value privacy	• Privacy control • Privacy risk • Privacy concerns	• NA	• Communication privacy management theory
Xu, Luo, Carroll, and Rosson (2011)	Location-based commerce	• Personalization • Previous privacy experience • Personal innovativeness • Coupon proneness	• Perceived benefits of information disclosure • Perceived risks of information disclosure • Perceived value of information disclosure • Willingness to have personal information used in LAM	• Personalization approach (covert vs. overt) × Personalization → Perceived benefits and risks of information disclosure	• Privacy calculus • Economic theory of utility
Xu, Teo, Tan, and Agarwal (2012)	Location-based commerce	• Industry self regulation • Government legislation • Individual self-protection	• Perceived control over personal information • Context specific concerns for information privacy	• NA	• Control agency theory • Justice theory
Yao et al. (2007)	Online information disclosure in general	• Psychological need for privacy • Self efficacy	• Beliefs in privacy rights • Internet use diversity • Internet use experience • Concerns about privacy	• NA	• Social cognitive theory
Zhao et al. (2012)	Location-based social networks	• Incentives provision • Interaction promotion • Privacy control • Privacy policy • Awareness of legislation • Previous privacy invasions • Personal innovativeness	• Extrinsic benefits • Intrinsic benefits • Privacy concerns • Intention to disclose location information	• NA	• Justice theory • Privacy calculus
Zimmer, Arsal, Al-Marzouq, Moore, and Grover (2010)	e-commerce	• Trust • Privacy	• Intention to disclose information • Actual disclosure behavior	• NA	• Social response theory • Theory of reasoned action
Zimmer, Arsal, Al-Marzouq, and Grover (2010)	e-commerce	• Trust • Risk • Relevance	• Attitude • Intention • Actual disclosure	• NA	• Theory of reasoned action • Transaction cost economics

References

Adams, J. S. (1963). Towards an understanding of inequity. *The Journal of Abnormal and Social Psychology, 67*(5), 422.

Anderson, C. L., & Agarwal, R. (2011). The digitization of healthcare: Boundary risks, emotion, and consumer willingness to disclose personal health information. *Information Systems Research, 22*(3), 469–490.

Angst, C. M., & Agarwal, R. (2009). Adoption of electronic health records in the presence of privacy concerns: The elaboration likelihood model and individual persuasion. *MIS Quarterly, 33*(2), 339–370.

Au, N., Ngai, E. W., & Cheng, T. E. (2008). Extending the understanding of end user information systems satisfaction formation: An equitable needs fulfillment model approach. *MIS Quarterly, 32*(1).

Awad, N. F., & Krishnan, M. (2006). The personalization privacy paradox: An empirical evaluation of information transparency and the willingness to be profiled online for personalization. *MIS Quarterly, 30*(1), 13–28.

Bakan, D. (1966). *The duality of human existence*. Chicago, IL: Rand McNally.

Bansal, G., Zahedi, F., & Gefen, D. (2010). The impact of personal dispositions on information sensitivity, privacy concern and trust in disclosing health information online. *Decision Support Systems, 49*(2), 138–150.

Bélanger, F., & Crossler, R. E. (2011). Privacy in the digital age: A review of information privacy research in information systems. *MIS Quarterly, 35*(4), 1017–1042.

Bem, S. L. (1981). The BSRI and gender schema theory: A reply to spence and helmreich. *Psychological Review, 88*(4), 369–371.

Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly, 29*(1), 87–111.

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210–230.

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin, 125*(3), 367–383.

Carlson, R. (1971). Sex differences in ego functioning: Exploratory studies of agency and communion. *Journal of Consulting and Clinical Psychology, 37*(2), 267–277.

Chai, S., Das, S., & Rao, H. R. (2011). Factors affecting bloggers' knowledge sharing: An investigation across gender. *Journal of Management Information Systems, 28*(3), 309–342.

Chakraborty, R., Vishik, C., & Rao, H. R. (2013). Privacy preserving actions of older adults on social media: Exploring the behavior of opting out of information sharing. *Decision Support Systems, 55*(4), 948–956.

Chen, R. (2013a). Living a private life in public social networks: An exploration of member self-disclosure. *Decision Support Systems, 55*(3), 661–668.

Chen, R. (2013b). Member use of social networking sites—An empirical examination. *Decision Support Systems, 54*(3), 1219–1227.

Chen, X., Ma, J., Jin, J., & Fosh, P. (2013). Information privacy, gender differences, and intrinsic motivation in the workplace. *International Journal of Information Management, 33*(6), 917–926.

Cheung, C. M., & Lee, M. K. (2006). Understanding consumer trust in Internet shopping: A multidisciplinary approach. *Journal of the American Society for Information Science and Technology, 57*(4), 479–492.

Childers, T. L., Carr, C. L., Peck, J., & Carson, S. (2002). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing, 77*(4), 511–535.

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research, 14*(2), 189–217.

Chiu, C.-M., Cheng, H.-L., Huang, H.-Y., & Chen, C.-F. (2013). Exploring individuals' subjective well-being and loyalty towards social network sites from the perspective of network externalities: The Facebook case. *International Journal of Information Management, 33*(3), 539–552.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O., & Ng, K. Y. (2001). Justice at the millennium: a meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology, 86*(3), 425–445.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace 1. *Journal of Applied Social Psychology, 22*(14), 1111–1132.

Deaux, K. (1984). From individual differences to social categories: Analysis of a decade. *American Psychologist, 39*(2), 105–116.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Springer.

Dinev, T., Bellotto, M., Hart, P., Russo, V., Serra, I., & Colautti, C. (2006). Privacy calculus model in e-commerce–A study of Italy and the United States. *European Journal of Information Systems, 15*(4), 389–402.

Dinev, T., & Hart, P. (2006a). An extended privacy calculus model for e-commerce transactions. *Information Systems Research, 17*(1), 61–80.

Dinev, T., & Hart, P. (2006b). Internet privacy concerns and social awareness as determinants of intention to transact. *International Journal of Electronic Commerce, 10*(2), 7–29.

Dinev, T., Hart, P., & Mullen, M. R. (2008). Internet privacy concerns and beliefs about government surveillance–An empirical investigation. *Journal of Strategic Information Systems, 17*(3), 214–233.

Dinev, T., Xu, H., Smith, J. H., & Hart, P. (2013). Information privacy and correlates: An empirical attempt to bridge and distinguish privacy-related concepts. *European Journal of Information Systems, 22*(3), 295–316.

Eagly, A. H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Erlbaum.

Fang, Y., & Neufeld, D. (2009). Understanding sustained participation in open source software projects. *Journal of Management Information Systems, 25*(4), 9–50.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Fusco, S. J., Michael, K., & Michael, M. (2010). Using a social informatics framework to study the effects of location-based social networking on relationships between people: A review of literature. In K. Michael (Ed.), *2010 IEEE international symposium on technology and society (ISTAS)* (pp. 157–171). Los Alamitos, CA: IEEE.

Gefen, D., & Straub, D. W. (1997). Gender differences in the perception and use of e-mail: An extension to the technology acceptance model. *MIS Quarterly, 21*(4), 389–400.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice, 19*(2), 139–152.

Ho, S. Y., & Chau, P. Y. (2013). The effects of location personalization on integrity trust and integrity distrust in mobile merchants. *International Journal of Electronic Commerce, 17*(4), 39–72.

Hofstede, G. (1991). *Cultures and organizations: Software of the mind*. London: McGraw Hill.

Hsu, C.-L., & Lin, J. C.-C. (2008). Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information & Management, 45*(1), 65–74.

Huang, Q., Davison, R. M., & Gu, J. (2011). The Impact of Trust, Guanxi Orientation and face on the intention of Chinese employees and managers to engage in peer-to-peer tacit and explicit knowledge sharing. *Information Systems Journal, 21*(6), 557–577.

Hui, K.-L., Teo, H. H., & Lee, S.-Y. T. (2007). The value of privacy assurance: An exploratory field experiment. *MIS Quarterly, 31*(1), 19–33.

Jiang, Z. J., Heng, C. S., & Choi, B. C. (2013). Privacy concerns and privacy-protective behavior in synchronous online social interactions. *Information Systems Research, 24*(3), 579–595.

Junglas, I. A., Johnson, N. A., & Spitzmüller, C. (2008). Personality traits and concern for privacy: An empirical study in the context of location-based services. *European Journal of Information Systems, 17*(4), 387–402.

Keil, M., Tan, B. C. Y., Wei, K.-K., Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly, 24*(2), 299–325.

Kim, D. J. (2008). Self-perception-based versus transference-based trust determinants in computer-mediated transactions: A cross-cultural comparison study. *Journal of Management Information Systems, 24*(4), 13–45.

Krasnova, H., Spiekermann, S., Koroleva, K., & Hildebrand, T. (2010). Online social networks: Why we disclose. *Journal of Information Technology, 25*(2), 109–125.

Ku, Y.-C., Chen, R., & Zhang, H. (2013). Why do users continue using social networking sites? An exploratory study of members in the United States and Taiwan. *Information & Management, 50*(7), 571–581.

Li, H., Gupta, A., Zhang, J., & Sarathy, R. (2014). Examining the decision to use standalone personal health record systems as a trust-enabled fair social contract. *Decision Support Systems, 57*, 376–386.

Li, H., Sarathy, R., & Xu, H. (2011). The role of affect and cognition on online consumers' decision to disclose personal information to unfamiliar online vendors. *Decision Support Systems, 51*(3), 434–445.

Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. *MIS Quarterly, 31*(1), 59–87.

Lin, H.-F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science, 33*(2), 135–149.

Lin, K.-Y., & Lu, H.-P. (2011). Why people use social networking sites: An empirical study integrating network externalities and motivation theory. *Computers in Human Behavior, 27*(3), 1152–1161.

Liu, C., Marchewka, J. T., Lu, J., & Yu, C.-S. (2004). Beyond concern: A privacy–trust–behavioral intention model of electronic commerce. *Information & Management, 42*(1), 127–142.

Lowry, P. B., Cao, J., & Everard, A. (2011). Privacy concerns versus desire for interpersonal awareness in driving the use of self-disclosure technologies: The case of instant messaging in two cultures. *Journal of Management Information Systems, 27*(4), 163–200.

Lowry, P. B., Moody, G., Vance, A., Jensen, M., Jenkins, J., & Wells, T. (2012). Using an elaboration likelihood approach to better understand the persuasiveness of website privacy assurance cues for online consumers. *Journal of the American Society for Information Science and Technology, 63*(4), 755–776.

Luo, X., & Seyedian, M. (2003). Contextual marketing and customer-orientation strategy for e-commerce: An empirical analysis. *International Journal of Electronic Commerce, 8*(2), 95–118.

Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information Systems Research, 15*(4), 336–355.

Midha, V. (2012). Impact of consumer empowerment on online trust: An examination across genders. *Decision Support Systems, 54*(1), 198–205.

Ngai, E. W., Tao, S. S., & Moon, K. K. (2015). Social media research: Theories, constructs, and conceptual frameworks. *International Journal of Information Management, 35*(1), 33–44.

Nysveen, H., Pedersen, P. E., & Thorbjørnsen, H. (2005). Explaining intention to use mobile chat services: Moderating effects of gender. *Journal of Consumer Marketing, 22*(5), 247–256.

Pavlou, P. A. (2011). State of the information privacy literature: Where are we now and where should we go. *MIS Quarterly, 35*(4), 977–988.

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly, 31*(4), 623–656.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.

Posey, C., Lowry, P. B., Roberts, T. L., & Ellis, T. S. (2010). Proposing the online community self-disclosure model: The case of working professionals in France and the UK who use online communities. *European Journal of Information Systems, 19*(2), 181–195.

Premazzi, K., Castaldo, S., Grosso, M., Raman, P., Brudvig, S., & Hofacker, C. F. (2010). Customer information sharing with e-vendors: The roles of incentives and trust. *International Journal of Electronic Commerce, 14*(3), 63–91.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78.

Shah, M. H., Peikari, H. R., & Yasin, N. M. (2014). The determinants of individuals' perceived e-security: Evidence from Malaysia. *International Journal of Information Management, 34*(1), 48–57.

Shang, R.-A., Chen, Y.-C., & Shen, L. (2005). Extrinsic versus intrinsic motivations for consumers to shop on-line. *Information & Management, 42*(3), 401–413.

Sheng, H., Nah, F. F.-H., & Siau, K. (2008). An experimental study on ubiquitous commerce adoption: Impact of personalization and privacy concerns. *Journal of the Association for Information Systems, 9*(6), 344–376.

Shim, J., Dekleva, S., Guo, C., & Mittleman, D. (2011). Twitter, Google, iPhone/iPad, and Facebook (TGIF) and smart technology environments: How well do educators communicate with students via TGIF? *Communications of AIS, 29*, 657–672.

Smith, H. J., Dinev, T., & Xu, H. (2011). Information privacy research: An interdisciplinary review. *MIS Quarterly, 35*(4), 989–1016.

Son, J.-Y., & Kim, S. S. (2008). Internet users' information privacy-protective responses: A taxonomy and a nomological model. *MIS Quarterly, 32*(3), 503–529.

Spence, J. T., & Helmreich, R. L. (1978). *Masculinity, femininity: Their psychological dimensions, correlates, and antecedents*. Austin: The University of Texas Press.

Squicciarini, A. C., Xu, H., & Zhang, X. L. (2011). CoPE: Enabling collaborative privacy management in online social networks. *Journal of the American Society for Information Science and Technology, 62*(3), 521–534.

Suh, B., & Han, I. (2003). The impact of customer trust and perception of security control on the acceptance of electronic commerce. *International Journal of Electronic Commerce, 7*(3), 135–161.

Taylor, M. C., & Hall, J. A. (1982). Psychological androgyny: Theories, methods, and conclusions. *Psychological Bulletin, 92*(2), 347–366.

Teo, T. S., Lim, V. K., & Lai, R. Y. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega, 27*(1), 25–37.

Tsai, J. Y., Egelman, S., Cranor, L., & Acquisti, A. (2011). The effect of online privacy information on purchasing behavior: An experimental study. *Information Systems Research, 22*(2), 254–268.

Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly, 28*(4), 695–704.

Van Slyke, C., Shim, J., Johnson, R., & Jiang, J. (2006). Concern for information privacy and online consumer purchasing. *Journal of the Association for Information Systems, 7*(6), 415–444.

Varnali, K., & Toker, A. (2010). Mobile marketing research: The-state-of-the-art. *International Journal of Information Management, 30*(2), 144–151.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342–365.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204.

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly, 24*(1), 115–139.

Venkatesh, V., Morris, M., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157–178.

Wakefield, R. (2013). The influence of user affect in online information disclosure. *The Journal of Strategic Information Systems, 22*(2), 157–174.

Wilson, M., Daly, M., Gordon, S., & Pratt, A. (1996). Sex differences in valuations of the environment? *Population and Environment, 18*(2), 143–159.

Wu, J., & Lu, X. (2013). Effects of extrinsic and intrinsic motivators on using utilitarian, hedonic, and dual-purposed information systems: A meta-analysis. *Journal of the Association for Information Systems, 14*(3), 153–191.

Xu, H., Dinev, T., Smith, J., & Hart, P. (2011). Information privacy concerns: Linking individual perceptions with institutional privacy assurances. *Journal of the Association for Information Systems, 12*(12), 798–824.

Xu, H., & Gupta, S. (2009). The effects of privacy concerns and personal innovativeness on potential and experienced customers' adoption of location-based services. *Electronic Markets, 19*(2–3), 137–149.

Xu, H., Luo, X. R., Carroll, J. M., & Rosson, M. B. (2011). The personalization privacy paradox: An exploratory study of decision making process for location-aware marketing. *Decision Support Systems, 51*(1), 42–52.

Xu, H., Teo, H.-H., Tan, B. C., & Agarwal, R. (2009). The role of push-pull technology in privacy calculus: The case of location-based services. *Journal of Management Information Systems, 26*(3), 135–174.

Xu, H., Teo, H.-H., Tan, B. C., & Agarwal, R. (2012). Effects of individual self-protection, industry self-regulation, and government regulation on privacy concerns: A study of location-based services. *Information Systems Research, 23*(4), 1342–1363.

Yao, M. Z., Rice, R. E., & Wallis, K. (2007). Predicting user concerns about online privacy. *Journal of the American Society for Information Science and Technology, 58*(5), 710–722.

Zhang, K. Z., Cheung, C. M., & Lee, M. K. (2014). Examining the moderating effect of inconsistent reviews and its gender differences on consumers' online shopping decision. *International Journal of Information Management, 34*(2), 89–98.

Zhao, L., Lu, Y., & Gupta, S. (2012). Disclosure intention of location-related information in location-based social network services. *International Journal of Electronic Commerce, 16*(4), 53–90.

Zhou, T. (2013). Examining continuous usage of location-based services from the perspective of perceived justice. *Information Systems Frontiers, 15*, 141–150.

Zimmer, J. C., Arsal, R. E., Al-Marzouq, M., & Grover, V. (2010). Investigating online information disclosure: Effects of information relevance, trust and risk. *Information & Management, 47*(2), 115–123.

Zimmer, J. C., Arsal, R., Al-Marzouq, M., Moore, D., & Grover, V. (2010). Knowing your customers: Using a reciprocal relationship to enhance voluntary information disclosure. *Decision Support Systems, 48*(2), 395–406.