
Privacy Concerns Versus Desire for Interpersonal Awareness in Driving the Use of Self-Disclosure Technologies: The Case of Instant Messaging in Two Cultures

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ABSTRACT: Social computing technologies typically have multiple features that allow users to reveal their personal information to other users. Such self-disclosure (SD) behavior is generally considered positive and beneficial in interpersonal communication and relationships. Using a newly proposed model based on social exchange theory, this paper investigates and empirically validates the relationships between SD technology use and culture. In particular, we explore the effects of culture on information privacy concerns and the desire for online interpersonal awareness, which influence attitudes toward, intention to use, and actual use of SD technologies. Our model was tested using arguably the strongest social computing technology for online SD— instant messaging (IM)—with users from China and the United States. Our findings reveal that cross-cultural dimensions are significant predictors of information privacy concerns and desire for online awareness, which are, in turn, found to be predictors of attitude toward, intention to use, and actual use of IM. Overall, our proposed model is applicable to both cultures. Our findings enhance the theoretical understanding of the effects of culture and privacy concerns on SD technologies and provide practical suggestions for developers of SD technologies, such as adding additional control features to applications.

KEY WORDS AND PHRASES: instant messaging, privacy, self-disclosure, self-disclosure technologies, social computing technologies, social exchange theory, theory of reasoned action.

SOCIAL COMPUTING TECHNOLOGIES (SCTs), such as blogs, Twitter, instant messaging (IM), podcasts, and social networking Web sites (e.g., Facebook), have become increasingly popular in the past few years. These technologies facilitate online social interaction and therefore create or recreate social conventions and social contexts [82, 103]. Many SCTs allow individuals to intentionally and voluntarily self-disclose their personal information to others in interpersonal relationships. For example, IM users reveal their current status to their “buddies.” Facebook users share their personal profiles and updates with their friends and sometimes even strangers. Such self-disclosure (SD) behavior is generally considered positive and beneficial in interpersonal communication and relationships because it reduces stress, builds intimacy, and increases social approval for one’s ideas [5, 19, 35, 86, 94]. Thus, enabling SD is one of the key reasons for the success of many SCTs. We refer to SCTs that support the SD process online as *SD technologies*.

Social computing as a field of research is relatively young, and so far the understanding of SD technologies is limited [82]. New research needs to explore new theories of motivation for social computing that take into account behavioral issues, cultural norms, neurobiological factors, and evolutionary issues [82]. In this paper, we address this need by focusing on the social, behavioral, and cultural influences on the adoption and use of SD technologies.

Using social exchange theory [5, 34, 51, 53, 94, 113, 119], we propose that the balance between the connection to and the awareness of others and protection and privacy concerns affects the use of SD technologies. As researchers have discovered,

SD enables near-continuous awareness between one individual and others but often introduces challenges for privacy protection [56, 103]. Hence, we investigate whether people who desire to be connected with others have a more positive attitude toward SD technologies and whether people who are concerned about information privacy avoid using SD technologies.

Researchers have also found that people use SCTs differently, depending on factors such as the user's culture. A case study found that Chinese Internet users are frequent users of social networking applications, while German consumers seem generally less likely to use social applications [36]. Another study found usage pattern differences in social networking services in the United States, France, China, and South Korea [12]. Another revealed varied usage patterns of IM associated with different cultures [54]. Finally, a study that investigated the effect of demographics, media experience, media richness perception, and national culture on media preferences found distinct differences between Australian and Chinese IM users [38].

In addition to SCT usage, several articles claim that because computer-mediated communication (CMC) is global in nature, concerns about privacy and awareness in CMC vary according to cultural dimensions [55, 59, 77, 78]. For example, privacy is viewed as a human right in Europe but is more negotiable in the United States, and those differences greatly affect how privacy is treated by individuals in those areas [112]. A recent study showed that national cultures and individuals may vary in terms of individualism versus collectivism, power distance, and uncertainty avoidance, and that these factors can lead to differences in privacy concerns, desire for awareness, and attitudes toward IM [11]. This preliminary research, along with past findings, indicates that SD usage patterns may be heavily influenced by culture and are mediated by privacy concerns and what we define as desire for awareness. Based on these opportunities, our study seeks to theoretically and empirically address the following research questions:

RQ1: What are the cultural dimensions that drive privacy concerns and desire for awareness in online SD, and are these different in distinct national cultures?

RQ2: Which is a stronger driver of the use of SD technologies, privacy concerns or desire for awareness?

RQ3: Are there key cross-cultural differences that drive SD technology use in distinct national cultures? Are there cross-cultural differences in privacy concerns, desire for awareness, and SD technology use?

Theory to Predict Use of Self-Disclosure Technologies

OUR THEORETICAL MODEL ADDRESSES THE UNDERLYING FACTORS that best predict the use of Web-based SD technologies. Our scope requires having one or more people engage in interpersonal dialog, and thus our theoretical scope does not include traditional e-commerce transactions and disclosures on the Web to unknown entities or third-party

business entities. Instead, we include only technologies that facilitate interpersonal communication and SD—namely, e-mail, social networking sites, blogs, Twitter, and IM.

Interpersonal Self-Disclosure

To better understand SD technologies, it is important to first understand SD. *Self-disclosure* occurs during interpersonal communication and refers to the personal information individuals intentionally and voluntarily reveal about themselves to others in an interpersonal relationship [19, 85, 94]. In interpersonal communication and relationships, SD is generally a positive and beneficial act that reduces stress, builds intimacy in a relationship, and increases social approval of one's ideas [5, 19, 35, 86, 94]. Technologies frequently used for SD include e-mail, social networking sites, blogs, Twitter, and IM. However, as seen later in this section, they do not support the SD process equally.

It should be clear that true interpersonal, intimate SD (the focus of our study) typically does not happen in an e-commerce setting because disclosures during e-commerce transactions are devoid of critical elements of interpersonal SD that involve reciprocity, intimacy, social bonding, and related social benefits [29, 58, 94]. SD is a relationship builder, not a business transaction, although SD can happen in a business setting if interpersonal relationships are involved. In interpersonal SD, the person who is disclosing personal information is doing so intentionally and to a known human audience. For these reasons, the assumptions about risks, costs, benefits, and disclosure that are seen in a wide array of e-commerce and information systems (IS) literature (e.g., [21, 22, 23, 24, 73, 109, 123]) do not apply equally to interpersonal SD that occurs via Web-based technologies. We thus concern ourselves with the adoption and use of SD technologies and incorporate the theory of reasoned action (TRA) to identify the factors that best predict use of SD technologies. Because TRA is commonly used and well known throughout IS research, we omit a detailed discussion of the theory's fundamentals and refer the reader to the seminal references (e.g., [4, 32, 33, 76]).

Model Foundation in the Theory of Reasoned Action

Like other IS studies (e.g., [76]), our study omitted subjective norms as a major predictor of behavioral intention. This omission is justified throughout the IS literature because the effects of subjective norms are difficult to separate from attitude: Subjective norms may influence behavioral intentions indirectly through attitude [17, 76]. Attitude¹ toward an act or behavior is consistently a stronger predictor of behavior than subjective norms (e.g., [47, 60, 63, 101, 116, 118]). For clarity in modeling, we focus on positive attitudes only, not negative attitudes.

Our context deals with experienced SD technology users with mature beliefs—implying that many other factors affect users' attitudes regarding SD technology use. Although researchers often use beliefs as a substitute for attitudes, it is more appropriate to focus first on attitudes and the elements that affect these attitudes and



Figure 1. TRA Adapted to SD Technologies

second on beliefs. Our assumptions about and approach to attitudes and beliefs have been used in other major IS studies (e.g., [47, 60, 63, 101, 116, 118]). Importantly, “external variables” or beliefs may influence behavior indirectly through attitude or subjective norms [33]. Thus, we are interested in external variables (including personality, cognitive style, and task characteristics [17, 62]) and beliefs, and their combined effect on attitude and behavior. For modeling clarity, *attitude* in our context is a positive attitude toward SD technology use. Based on TRA, we propose that behavioral intention to use SD technology positively predicts use of SD technology (P1). Likewise, positive attitude toward SD technology positively predicts behavioral intention to use SD technology (P2). Figure 1 depicts our basic adaptation of TRA to SD technology use.

Integrating Social Exchange Theory into Our Model

An important theoretical assumption for our model is that use of SD technology is a communication act involving disclosure of information; thus, the attitudes one forms are directly related to one’s beliefs about disclosing personal information via an SD technology. However, it is pivotal that the conceptualization of attitudes is not just about beliefs about a behavior, but an assessment of one’s beliefs regarding the consequences arising from a behavior and an evaluation of the desirability of these consequences. This is consistent with TRA, which describes beliefs as the subjective probability that performing a behavior will result in certain consequences [33]. We thus looked for key attitudes that are likely to influence beliefs about disclosing information via SD technology; in turn, these beliefs directly relate to likely consequences and related attitude formation.

We develop the theoretical basis for these attitudes based on social exchange theory. Social exchange theory explains the cognitive process that people go through before allowing themselves to disclose information in an interpersonal interaction, as they weigh the costs and benefits of SD [5, 34, 51, 53, 94, 113, 119]. Foreseen costs that are greater than foreseen benefits decrease SD in the desired interpersonal relationship; benefits greater than the costs increase SD.

Although social exchange theory has been used several times in IS research, the theory has typically been applied to business-oriented relationships, not intimate interpersonal relationships. Examples include information reciprocation between employees and their organizations [51], information sharing in professional networks [119], contribution to knowledge repositories [53], the effects of implementation-team responsiveness on user evaluations and approval of a system [34], knowledge shar-

ing in virtual work teams [108], knowledge sharing in information technology (IT) outsourcing [61], and the effect of SD on relationships with electronic trading partners [107]. None of the extant IS research on social exchange theory and SD has focused on traditional SD in intimate interpersonal relationships. We address this topic in an online context and include attitudes about the costs and benefits of online SD that are most pertinent to extending our model with social exchange theory. Thus, investigating what costs and benefits are typically examined in an interpersonal SD scenario is imperative. Using this economics-based perspective, a review of the SD literature indicates that the SD costs involve the risks of disclosing too much and having one's privacy invaded; the benefits refer to reciprocal communication, awareness, and intimacy [5, 7, 19, 20, 29, 53, 58, 94, 98].

Sherby [98] aptly summarizes these tensions in the SD literature as a trade-off between the need for connection and the need for protection in interpersonal communication and relationships. People want to feel a sense of connection, awareness, and intimacy, which helps them feel comfort and rewards disclosing personal information to others; however, people do not want to feel regret about their disclosures. People want to maintain their privacy and confidence and disclose personal information only to specific parties.

In summary, we posit that positive attitudes toward SD technology use will be formed primarily by the degree to which a person desires protection and connection during SD. We extend these general notions of protection and connection to specific concepts that are similarly salient in online interpersonal communication. Protection desires can be represented by the degree of concern for information privacy; connection can be represented by a host of CMC literature on awareness and connection, which we term *desire for online interpersonal awareness*.

Information Privacy Concerns

The general concept of *privacy* is individuals' ability to maintain personal space by limiting others' physical access to them or information about them [121]. Privacy concerns deal with the worry or belief that one's privacy may be at risk and that this is undesirable [21, 73, 109]. Extant IS research has shown privacy concerns to be a strong predictor of privacy-related behaviors (e.g., [21, 73, 109]). In the IS and e-commerce literature, privacy is generally defined in terms of the desire to control others' access to and use of personal information [23, 55, 74, 123, 124]; however, to be more accurate for our purposes, this usage refers only to the second aspect of privacy—namely, information privacy. Thus, we use the specific term *information privacy* instead of the broader term *privacy*.

Information privacy refers to "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" [73, p. 337] and is related to all other aspects of privacy [30]. The concept of privacy concerns has been further refined conceptually and in terms of measurement as information privacy concerns [73, 104, 105]. Specifically, information privacy concerns "refer to an individual's subjective views of fairness

within the context of information privacy” [73, p. 337]. Such concerns are “beliefs about who has access to information that is disclosed when using the Internet and how it is used” [21, p. 65]. Smith et al. [105] established four subconstructs of information privacy concerns, which are still considered highly reliable [122].

These four subconstructs of information privacy concerns are collection, errors, secondary use, and improper access [105]. *Collection* describes the “concern that extensive amounts of personally identifiable data are being collected and stored in databases” [105, p. 172]. *Errors* refers to the “concern that protections against deliberate and accidental errors in personal data are inadequate” [105, p. 172]. *Unauthorized secondary use* refers to the “concern that information is collected from individuals for one purpose but is used for another [purpose]” [105, p. 172] by the collecting party or by an entity that is external to the relationship. Finally, *improper access* to information indicates a “concern that data about individuals are readily available to people not properly authorized to view or work with this data” [105, p. 172]. Although these subconstructs were conceptualized and measured in an organizational context, at face value they are robust enough to represent information privacy concerns in general, as validated by a host of IS studies that have used these measures for many other privacy-related purposes (e.g., [28, 40, 81, 95, 106, 123]). This flexibility is useful in the context of SD technologies because they are increasingly used for both work and personal use [54]; thus, information privacy concerns become conflated between professional and personal use.

The technology usage and adoption literature has consistently shown that information privacy concerns affect the adoption of various technologies [21, 22, 23, 67, 115, 124]. Most of this literature indicates that concern for information privacy is a negative factor in technology adoption because of the driving desire not to divulge personal information. However, we posit that this status quo assumption about technology adoption and privacy fits poorly with SD technologies because these technologies support interpersonal communication where SD is highly desired in order to support interpersonal relationships. In particular, when interpersonal SD online is a key relationship goal, concern for privacy will not stop SD but will encourage one to focus on SD technology that can positively support both SD and information privacy.

Desire for Online Interpersonal Awareness

The desire for and fulfillment of connection and interpersonal awareness appear throughout the CMC and SD technology literature.² For our study, the existing concepts are all summarized within an encompassing concept we call *online interpersonal awareness*, which we define as the awareness of the presence, connections, and activities of others in a shared interaction experience via a mediated online technology. We define *desire for online interpersonal awareness* as the motivation to experience online interpersonal awareness. This awareness of the presence, connections, and activities of others is accomplished in a shared awareness workspace through which all participants communicate and work, and without such awareness, distributed communication and coordination break down [68, 69, 120]. Accordingly, communicators feel in touch

with others and experience several potential benefits, such as implicit coordination, awareness of whether someone is available to communicate, positive social pressure to contribute and disclose, and enhanced interpersonal communication [1, 27, 39, 48, 57, 68, 69, 120]. Systems to enhance this awareness between communicators—through shared interface design (particularly in distributed, online settings)—have been designed and tested in a substantial body of research (e.g., [16, 27, 39, 48, 68, 69, 96, 97]). Because such awareness is desirable and natural in online distributed interactions and lack of such awareness is detrimental to the same interactions [1, 27, 48, 57, 68, 69, 120], we assume desire for online interpersonal awareness to be particularly salient for those who wish to engage in interpersonal SD online.

Table 1 summarizes the particular definitions for the terms related to awareness, connection, and presence and describes how we apply them in our study.

Reciprocity and Boundary Management: Allowing Desire for Online Awareness and Information Privacy Concerns to Coexist

One may argue that users who are concerned about information privacy tend to respect and protect personal information space about themselves and others, and therefore may consider awareness and disclosure of personal information to be undesirable and at odds. However, research has shown that the relationship between these concepts is not that simplistic: attitudes of awareness can be negatively or positively related to attitudes of information privacy [83, 84]. This is further illuminated by the key concept of reciprocity in SD, which shows why desire for awareness, information privacy concerns, and willingness to provide awareness information to select others can mutually exist.

Reciprocity is an important element of SD that helps explain why people disclose information even though they may have information privacy concerns [94]. *Reciprocity* may best be explained as quid pro quo communication, synonymous with a “you tell me and I’ll tell you” orientation toward SD [52, pp. 25–26]. Reciprocity is a communication signal to a communicator that his or her relational partners are willing to accept a certain level of personal information vulnerability to continue the SD relationship, thereby increasing the individual’s assessment of the relationship’s worth and the need to maintain it via future SD [94]. Reciprocity therefore fosters intimacy, social bonding, and related social benefits [29, 58, 94], and drives deeper layers of SD and thus a greater willingness to be vulnerable to disclosing personal information, which maximizes the benefit of the interaction [53]. As disclosure recipients receive their relational partners’ personal privacy information over time, the recipients feel obligated to respond at a similar level of intimacy or a similar depth of personal information disclosure [5, 19]. Hence, through SD and reciprocity, one will also be more willing to share personal awareness information and privacy information about oneself to select others. As long as these select others are doing the same, concerns about information privacy and desire for awareness can coexist and be supported in interpersonal SD.

Along with reciprocity, the idea of boundary management is also used in SD research to explain the relationship between privacy concerns and the desire for awareness and

Table 1. Summary of Major Concepts Regarding Awareness, Connection, and Presence

Term	Definition	Application to our study
Group awareness [27, 57, 68, 69, 70]	“Group awareness is the ability to know what other group members are doing at a given time without direct communication; this implicitly increases social pressure on group members to contribute more, coordinate work, and avoid duplicate work” [69, pp. 176–177].	This is close to our application, but a group is not necessary for our purposes; we focus on interpersonal communication between two or more people. Lack of direct communication is also not necessary, though this is frequently a feature of technologies that provide workspace awareness.
Presence [1, 31, 99, 100, 111]; also referred to as virtual presence and telepresence	A sense of “being there” with other group members even though they are distributed and communicating electronically [99, 100].	Presence is assumed in our application of awareness but does not encompass the whole concept.
Awareness [16, 27, 48, 97, 120]	Applied in a CMC or online communication context, this is awareness of the presence and activities of others with whom one is communicating [16, 27, 48, 120].	We fully embrace this use for our study.
Connection [48, 57, 111]	A sense of being in contact with others in a shared experience [48, 57, 111].	Connection is assumed in our application of awareness but does not encompass the whole concept.
Workspace awareness [39, 96, 97]	This is essentially the same as awareness but with a focus on the fact that a shared workspace is used [39, 96].	Substantial research has shown that a shared workspace is required for online awareness (e.g., [16, 27, 39, 48, 68, 69, 96]); this is assumed in our application.

disclosure [5, 6, 18, 19, 87, 88, 89, 90, 91, 92]. The balance between privacy and SD in relationships is aptly described by communication boundary management theory (CBMT) [87]. CBMT explains how people balance disclosing and receiving private information by creating rules and conditions of information sharing. CBMT also explains the “coordination of boundaries where partners maintain separate yet connected communicative systems that are used to protect vulnerabilities when there is a need to disclose private information” [87, p. 312]. Given the flexible nature of SD technologies and the ability to control the amount of information disclosed, we posit that SD technology furthers the needs for both reciprocity and boundary management.

Further Assumptions of Our Model

Before finalizing our propositions, we must further define other limiting assumptions of our model. Our model assumes that participants desire interpersonal interaction and SD online and that they have a choice about how to maximize their personal privacy and a desire for awareness. Thus, the model does not apply to cases where people have no desire to disclose information to others online or where they desire absolute information privacy, either of which would completely negate interpersonal interaction.

From a TRA perspective, people concerned about information privacy first evaluate the consequences and desirability of SD technology use in terms of information privacy threats versus the potential benefits of SD. These evaluations should be in a positive direction if one feels that the SD technology reasonably protects information privacy but allows for awareness opportunities. These positive evaluations should result from the increased potential for information privacy in SD use compared to other communication technologies that do not protect information privacy as well as the evaluated SD technology. This was shown in Cao and Everard [11]. Consistent with this idea, SD technologies that are seen as low in information privacy protection (e.g., blogs) may result in negative evaluations. Thus, we assume users desire SD technologies that have high privacy protection and awareness capabilities—not low abilities.

Given these enhanced definitions and the assumption that one desires SD, we posit that the more that people have information privacy concerns (P3) and desire interpersonal awareness with others online (P4), the more they will have positive attitudes toward using SD technologies—assuming the technologies have high information privacy and awareness capabilities. This basic extension to our model is depicted in Figure 2.

Adding Cultural Differences

As a final extension to our model, we posit that cultural differences will strongly influence desires for information privacy and online interpersonal awareness. These differences will have an important, albeit indirect, effect on the formation of one's attitudes toward SD technology. Our ultimate aim is to test specific differences be-

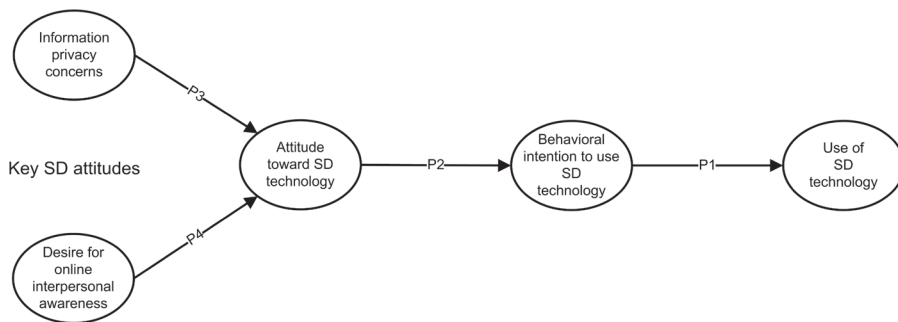


Figure 2. Basic Model Extension in Propositional Form

tween U.S. and Chinese SD technology users; however, we start by creating general propositions that can be used for other cultural comparisons.

The most commonly adopted cross-cultural dimensions come from Hofstede's [43] cross-cultural study, which presents data from more than 100,000 IBM employees in 40 countries. Hofstede defines culture as "the collective programming of the mind which distinguishes the members of one human group from another" [43, p. 5]. From Hofstede's study, four cultural dimensions emerged: masculinity/femininity, uncertainty avoidance, power distance, and individualism/collectivism. These four dimensions of cultural values have been widely validated and adopted in more than 100 cross-cultural studies undertaken in various disciplines [38]. Most multicultural IS research has been conducted on the national level, as was done by Kim [55]. However, national-level research may be too broad in that this level of research ignores the possibility of individual differences among cultural dimensions. Addressing this criticism much earlier in other domains, researchers reconceptualized Hofstede's cultural dimensions from a national level to an individual level of analysis and, in doing so, improved the factorial validity of the scales [11, 26]. Thus, as was done in Cao and Everard [11], we chose to conceptualize and measure culture from an individual-level perspective. Yet we also test our conceptual model using data collected from the United States and China and demonstrate some interesting differences between the two national cultures in the national-level model. We now describe these four cultural dimensions.

Masculinity

Masculinity describes the distribution of emotional roles in society [26, 43]. This dimension indicates how individuals in a society value work goals, assertiveness, competitiveness, and material possessions (masculinity) rather than personal goals, good working relationships, cooperation, and quality of life (femininity). "Femininity" and "masculinity" are not associated directly with gender [43]. China is high on the list of masculine cultures; the United States is considered moderately high, though not as high as China [43].

The literature on the effect of masculinity on information privacy is mixed. One study found that masculinity positively affected information privacy concerns [77], whereas another found the opposite [9]. However, although Milberg et al. [77] did not explain the reason the effect was positive, the other study pointed out that “high Masculinity (MAS) cultures place greater emphasis on achievement and material success, and perhaps the economic benefits of using private information, over caring relationships and quality of life” [9, p. 315]. To achieve work goals, highly masculine individuals may understand the need to forego a certain amount of privacy; conversely, highly feminine individuals are less achievement oriented, less competitive, and may have greater information privacy concerns. We thus posit that higher levels of masculinity decrease one’s information privacy concerns (P5a).

Having online interpersonal awareness may help individuals in highly masculine cultures better comprehend the situation of their communication partners and better assert themselves—issues that highly masculine individuals value. Likewise, an individual from a highly masculine culture might appreciate knowing where co-workers are, what they are doing, whether they are available for an impromptu meeting, and so forth. Individuals from less competitive and assertive cultures may not find such information as valuable. Accordingly, we posit that masculinity positively affects desire for online interpersonal awareness (P6a).

Uncertainty Avoidance

Uncertainty avoidance is “the degree to which members of a society feel uncomfortable with uncertainty and ambiguity” [44, p. 83]. People with high uncertainty avoidance show a need for minimizing unpredictability in their lives by embracing structure, seeking control over their environment, showing a stronger faith in government and rules-based institutions, and resisting change in their personal and professional lives [66]. High uncertainty avoidance cultures and individuals need more general security in their lives, whereas low uncertainty avoidance cultures and individuals need adventure and stimulation [42]. Both China and the United States are classified as low uncertainty avoidance cultures [43].

As is the case with masculinity, the literature has mixed results on the effect of uncertainty avoidance on information privacy concerns. Both Bellman et al. [9] and Milberg et al. [77] hypothesized that uncertainty avoidance would have a positive effect on information privacy concerns because high uncertainty avoidance scores are associated with high levels of anxiety, stress, and concern for security. However, Milberg et al. [77] found the effect to be negative while Bellman et al. [9] found it to be nonsignificant. Another study found it to be positive [11]. Neither Bellman et al. [9] nor Milberg et al. [77] gave theoretical explanations for their results, but Cao and Everard [11] noted that individuals with high uncertainty avoidance scores would naturally avoid uncertainty about their personal information by limiting others’ access. With no further evidence, we concur with Cao and Everard’s [11] proposition and thus propose that higher uncertainty avoidance scores will positively increase information privacy concerns (P5b).

In a further application of uncertainty avoidance to our model with respect to awareness, interpersonal awareness of others online would certainly appeal to such individuals as a way to mitigate uncertainty in online interpersonal communication. Such individuals might use the awareness features of SD technology to control who has access to them [11]. Moreover, awareness of what others are doing provides additional certainty in interpersonal interactions. Thus, we posit that a higher uncertainty avoidance score will positively affect users' desire for online interpersonal awareness (P6b).

Power Distance

Power distance is the degree to which the less-powerful members of a society expect power to be distributed unequally. Individuals in high power distance cultures generally expect and accept that a level of inequality of power and wealth exists within society. Individuals in low power distance cultures, however, see a greater equality between societal levels,³ which reinforces cooperative interaction across power levels and a more stable cultural environment. China ranks high in power distance, whereas the United States ranks relatively low [43].

The literature provides a relatively consistent direction regarding power distance's effect on information privacy concerns. Although Milberg et al. [77] found a positive effect, both Bellman et al. [9] and Cao and Everard [11] found it to be negative. We posit that individuals in nonauthority positions in high power distance cultures can tolerate greater levels of power inequality and therefore are accustomed to authorities having access to their personal information [11]. Furthermore, high power distance cultures experience a more formal standard of control and authority. This is accompanied by more centralized knowledge, as well as more restrictions on the exchange of that knowledge [41]. Individuals in such highly regulated cultures would thus have fewer concerns about sensitive information being distributed. Accordingly, and in line with the findings of Bellman et al. [9] and Cao and Everard [11], we propose that higher power distance scores negatively affect information privacy concerns (P5c). In cultures high in power distance, formality and structure are encouraged, authority and control are more established, and exchange of knowledge is more restricted [41]. Interpersonal awareness in SD technology naturally adds structure and control to the communication process because without them it is impossible to know what other people are doing [1, 27, 39, 48, 57, 68, 69, 120]. Individuals using the interpersonal awareness features of SD technologies can control who is aware of their online presence, what they are currently busy with, and even who is allowed to contact them. We argue that the controllability offered by SD technology appeals to individuals from high power distance cultures, and thus higher power distance scores positively affect desire for online interpersonal awareness (P6c).

Individualism and Collectivism

Individualism and collectivism are the most studied cultural dimensions in IS literature [102]. *Individualism* describes cultures in which the bonds between individuals

are weak, individual decisions are encouraged, and individual achievement and initiative are emphasized [45, 125]. *Collectivism* “describes cultures in which people are integrated into strong, cohesive groups that protect individuals in exchange for unquestioning loyalty” [125, p. 65; see also 45]. The United States is a highly individualistic nation, while China is much less so [43].

Research results about the effect of individualism on information privacy concerns are also mixed. Milberg et al. [77] found the effect to be positive, Bellman et al. [9] found it to be negative, and Cao and Everard [11] found it to be nonsignificant. We chose to follow Bellman et al.’s results because they provide the most plausible theoretical explanation that is congruous with other studies—that people from high individualistic cultures are less concerned with higher levels of disclosure of private information [64, 114]. For example, students from the United States (individualism = 91) were found to be less concerned about privacy than students from Japan (individualism = 46) [75]. In addition, individualism is often strongly correlated with masculinity in cultural studies. Cultures high in these two related dimensions often value success, achievement, and economic gain, perhaps even over privacy [9]. Conversely, cultures low in masculinity (and, accordingly, higher in collectivism) have greater concern about preserving information privacy. We thus propose that higher collectivism scores positively affect information privacy concerns (P5d).

Finally, we discuss the effect of collectivism on the desire for online interpersonal awareness. Individuals whose cultures are highly collectivistic are more likely to desire committed, close, and strong relationships with others. The awareness features of SD technology offer aid in this area, facilitating cooperation and attentiveness to others’ needs. In contrast, people from individualistic cultures do not value cohesion and cooperation as highly as those from collectivistic cultures and thus would be less concerned about awareness information from others [41]. We thus posit that higher collectivism scores positively affect desire for online interpersonal awareness (P6d).

Figure 3 depicts our fully extended theoretical model with our additions for culture (negative relationships are shown as dotted lines).

Operationalizing Model to Instant Messaging Technology

Now that we have defined our proposed theoretical model, we can formulate hypotheses to test actual SD technology use. Rather than testing the full model with multiple kinds of SD technology, we start by testing the model with what we believe is the strongest form of SD technology—instant messaging. This is an important choice because technologies seen as weak in supporting SD while maintaining information privacy will result in negative attitude evaluations in our model. We also provide additional empirical support for this decision in the methodology and analysis sections. Before proposing our hypotheses, we further explain what IM is and why it is a particularly promising SD technology.

IM is an Internet-based communications technology that has exploded in personal and workplace use in recent years, with hundreds of millions of accounts worldwide in 2010. IM usage is deeply entrenched at home and at work, with 26 percent of IM

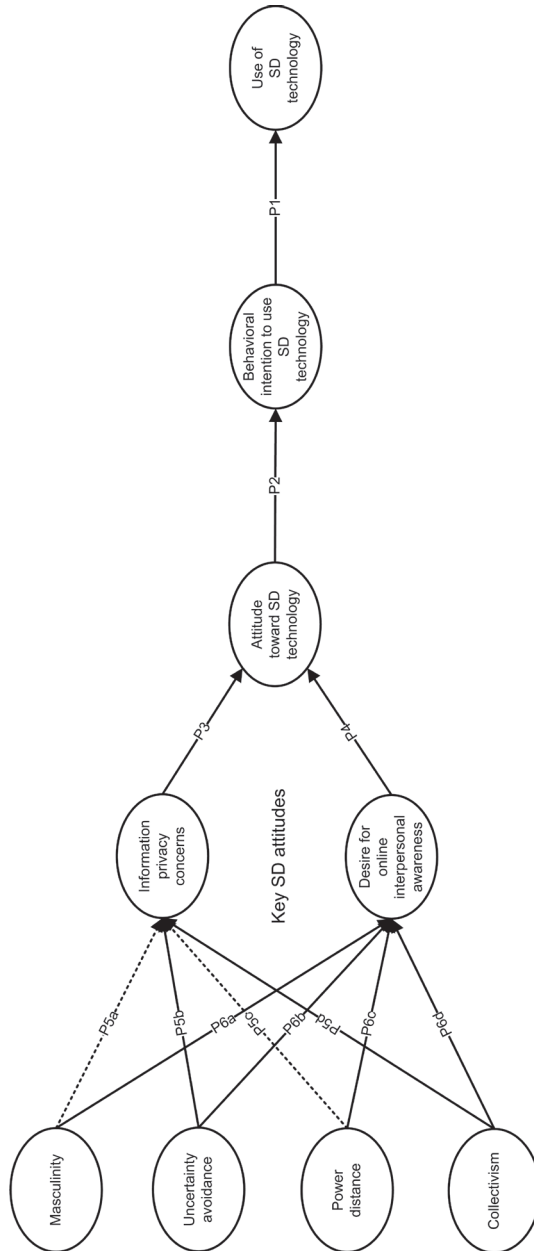


Figure 3. Fully Extended Theoretical Model in Propositional Form

Note: Dotted lines indicate negative relationships.

users surveyed by AOL using IM in the workplace [49]. By 2007, revenues from the IM market reached \$203 million and are expected to reach \$530 million in 2011 [49]. As a strong SD technology, IM is useful for both intimate and professional SD and interpersonal communication. One study found that the control features available with IM are an effective tool for managing visibility and interruptions in the workplace [80]. IM is also attractive to organizations because of its immediacy and its benefits for group collaboration [49]. Users can quickly ask questions and get clarifications, coordinate scheduling tasks and impromptu meetings, and build valuable social and professional networks. The primary use and one of the main benefits of IM in the workplace is the ability to aid employees in communicating with other employees to solve complex business problems [50]. Given the increased options with and complexity of IM compared to e-mail, it is not surprising that typical IM users are younger and more computer savvy than the general public [110]. This suggests that IM may continue to grow rapidly in the future and be more influential in business as this younger generation enters the general workforce. Moreover, IM is heavily used in both China and the United States, making this SD technology ideal for cross-cultural studies such as ours.

Despite the popularity and importance of IM, IS research on IM is just emerging. Such SD technology research has great potential because IM has radically changed the way people work, learn, socialize, and communicate [65]. Our review of the literature and extant online communication technologies leads us to believe that IM can best support the SD process in various cultural environments, as opposed to other technologies—especially compared to alternative technologies such as e-mail, blogging, Twitter, and social networking. IM has several important SD-friendly features to allow users full control of information privacy, as well as online awareness of others with whom users want to communicate.

Information Privacy Protection Afforded by Instant Messaging Technology

In terms of information privacy protection, IM offers several important features that allow users to participate in SD at their level of comfort in terms of information privacy concerns. IM supports a host of information privacy protection options, such as the ability to decide what kind of personal information is available to certain groups of people, if any. Unapproved people can be “blocked” so that they receive no information about a user and never know if that person is online or not. Furthermore, users can set their status to “offline” yet still receive full messaging from approved people, if they desire. IM also has permission settings so that users can control whether or not someone else needs their permission to be added to a group. In addition, IM technologies support one-on-one and encrypted group communications.

Because of the variety of possibilities, IM communication can closely resemble spoken interactions and mimic several of the core properties found in speech [65, 127]. Although this technology is often used in distributed settings, it can be used to simulate some of the key characteristics of informal face-to-face conversation, such as “being opportunistic, brief, and context-rich” [127, p. 148]. Unlike e-mail, blogs,

social networking sites, Twitter, and so on, IM users can communicate through text messages only, through text + voice, through voice only, through text + voice + video, and so on. This allows further control over disclosure. While IM is often used for synchronous communication, this technology also allows asynchronous communication. Such a varied set of IM features enables real-time communication with richer communication cues and many more options for control than other CMC methods such as e-mail and blogs [13, 65]. IM also supports “buddy lists” to differentiate who can view information about one’s availability, which allows an IM user to completely block unwanted interactions, spam, lurkers, or trolls. In fact, this overall personalized control over communication and information disclosure distinguishes IM from other SD technologies [8, p. 30].

Online Awareness of Others Afforded by Instant Messaging

IM not only provides the most control over one’s personal information privacy settings but also exceeds other SD technologies in its ability to provide control over awareness of and connection to others (and self) in online interactions. IM has many features that directly enhance awareness information by providing a sense of presence, identity, availability, locations, history, and so on. Such awareness extends from interpersonal dyads to small groups and even further to large groups or online communities. IM programs offer a number of features, such as contact or buddy lists and status messages, to allow users to know which users are online and available for conversation. Most IM programs also provide other features, such as customizable backgrounds, emoticons, and avatars, to make the conversation more informal and personal [13]. These features foster SD because users can have a range of identities and emotional disclosures that they can choose to employ. At the same time, IM allows control over the awareness and connection features. Aside from the blocking feature discussed earlier, if one is away or busy, customizable auto-reply messages can be sent to different groups of people. Yet the awareness as implemented by IM still provides the need for anonymity, space, and so forth because these features are highly controllable. Such awareness information provided by IM encourages informal, spontaneous communication because IM users are more likely to contact another IM user directly if they know that the person is available for conversation [97]. IM is also helpful for planning, orienting, and coordinating communications with other collaborators and thereby can increase collaborative work efficiency and effectiveness [83].

Hypotheses

In operationalizing our hypotheses, we do not distinguish private use from business use of IM, because previous studies indicate that people usually use IM for mixed purposes [54]. We also focus on a young generation of users (college students), who are considered to be the largest IM user group and the workforce of the future [37]. Given that IM likely is the most effective SD technology for supporting information

privacy and online awareness of others, our theoretical operationalization focuses on IM. Thus, assuming one desires to engage in SD online, we operationalize our propositions as follows:

Hypothesis 1: An increase in (a) masculinity and (b) power distance decreases information privacy concerns; an increase in (c) uncertainty avoidance and (d) collectivism increases information privacy concerns.

Hypothesis 2: An increase in (a) masculinity, (b) uncertainty avoidance, (c) power distance, and (d) collectivism increases desire for online interpersonal awareness.

Hypothesis 3: An increase in information privacy concerns increases positive attitude toward IM.

Hypothesis 4: An increase in desire for online interpersonal awareness increases positive attitude toward IM.

Hypothesis 5: An increase in positive attitude toward IM increases behavioral intention to use IM.

Hypothesis 6: An increase in behavioral intention to use IM increases actual use of IM.

Method

Exploratory Study on the Strongest Self-Disclosure Technologies

A KEY PREMISE OF OUR MODEL AND EMPIRICAL DATA is that IM technology is unique and supports the SD process better than other SD technologies, which is why we used IM to test our model. However, to further justify these theoretical assumptions about IM, we conducted an exploratory study on SD technologies to compare them in various dimensions that matter to the SD process. For this study, 35 senior-level and master's-level IS students volunteered; the volunteers had extensive experience in all SD technologies and used them all on a daily-to-weekly basis. These participants were ideal because the differences between these technologies did not need to be explained, and the students were highly aware of the technologies' many features and variations. In particular, we asked participants about the following: (1) social networking technologies (including Facebook and MySpace), (2) blogging technologies, (3) e-mail technologies, and (4) IM technologies.

In the context of interpersonal communication and SD, we asked participants to separately rate each family of technologies in terms of privacy risk, ability to facilitate a highly confidential conversation, support for control over communication, support for interpersonal awareness features, ability to provide reciprocity in communication, and support of highly intimate, one-on-one conversations. The participants' responses are summarized in Table 2.

Table 2. Self-Disclosure Support Differences in Social Computing Technologies

Technology	Means (standard deviations)				
	Risk	Confidential	Control	Awareness	Reciprocity
Blog	7.6 (2.3)	0.5 (0.7)	4.1 (2.7)	3.4 (2.7)	3.0 (2.5)
Social	7.4 (1.9)	1.1 (1.4)	4.1 (2.6)	5.8 (2.4)	5.1 (2.6)
E-mail	5.2 (2.0)	4.9 (1.9)	5.9 (2.5)	5.3 (2.9)	6.3 (2.8)
Instant messaging	5.4 (2.0)	4.0 (2.1)	5.7 (2.7)	7.7 (2.8)	7.5 (2.0)
					1.7 (1.9)
					2.5 (2.3)
					5.7 (2.6)
					6.3 (2.4)

Based on these results, we performed multivariate analysis of variance (MANOVA) on all the dependent variables, which indicated significant differences. The exploratory post hoc Tukey HSD (honestly significant difference) test showed that the perceived risk for blogging and social networking was higher than for e-mail and IM; the ability to sustain confidential conversations, to have control over conversations, to have reciprocal conversations, and to have intimate conversations was higher for e-mail and IM than for blogging and social networking. The key areas where IM was statistically higher than other technologies were reciprocity and awareness.

To further explore these technologies, we also asked respondents which technology they would most prefer to use if they were to have an intimate interpersonal conversation online where they cared about their privacy. Overwhelmingly (74.3 percent), respondents chose IM technology; 25.7 percent chose e-mail. No one chose social networking or blogging. These combined results further support our claim that in terms of SD technologies, IM is best positioned to support the SD process by protecting privacy and supporting awareness. Thus, if privacy and awareness are desired, experienced SD technology users are more likely to use IM than other SD technologies. This further supports our hypothesis that increased privacy concerns increases positive attitudes toward IM use (H3), with the caveat that a person desires to communicate with others he or she knows online and the person is familiar with SD technologies. Those who are unfamiliar and uncomfortable with SD technologies likely would show a negative relationship.

Survey

To test our theoretical model, we developed an online survey. The scales in the survey were adopted or adapted from existing validated scales whenever possible, and are summarized as follows: the four cultural dimensions of uncertainty avoidance, power distance, masculinity/femininity, and collectivism/individualism were measured by four multiple-item scales adapted from Dorfman and Howell [26]. Users' desire for online interpersonal awareness was measured by a four-item online awareness scale adapted from Gutwin and Greenberg [39]. Intention to use IM was assessed by a four-item measure adapted from Venkatesh and Davis [117]. IM use was based on a use measure that we modified to capture an individual's IM use based on the frequency/experience measures in Cao and Everard [11], using anchoring similar to the McKnight et al. [76] Web experience scale. Information privacy concerns were measured as four subdimensions: collection, error, unauthorized secondary use, and improper access, as created by Smith et al. [105].⁴

Two IS researchers and two graduate assistants reviewed the instrument and checked aspects of its face validity—including the length of the instrument, the format of the scales, and the content—and made sure that the questions were clear. One of the researchers developed a Chinese translation of the survey, and one of the graduate assistants back-translated the survey into English to ensure that the translation did not alter the meaning of the scales.

Data Collection Procedures

Undergraduate college students in China and the United States participated in the online survey because this age group constitutes a significant base of expert and frequent IM users. This is a particularly good match because IM users tend to be more computer savvy than the general public [110]. To improve the response rate, instructors sent an invitation letter containing the link for the survey directly to the students. A drawing for \$100 in cash was offered as an incentive.

Demographics of Participants

We limited the scope of our study to two countries with distinct national cultures—the United States and China. We selected these two countries because both have a large number of IM users [14],⁵ and although the cultures are generally very different, business collaboration and communication between the two countries have been steadily increasing in recent years. It is therefore helpful to understand how IM use in these two cultures differs to better manage the use of IM in cross-cultural communications.

Of the 486 participants, 284 (58.4 percent) were from China, and 202 (41.6 percent) were from the United States. Gender was distributed as follows: 243 men (50 percent), 232 women (47.8 percent), and 11 unreported (2.2 percent). Statistics for other demographic variables were as follows: age ($\mu = 22.0$, standard deviation = 3.12), education years ($\mu = 15.47$, standard deviation = 1.22), hours per day IM is open on one's computer ($\mu = 9.20$, standard deviation = 8.74), and hours per day one actually uses IM ($\mu = 2.30$, standard deviation = 2.32).

Analysis

WE FIRST PERFORMED SUBSTANTIAL ANALYSIS to establish factorial validity of the formative and reflective constructs. We then established cross-cultural equivalence and tested for common methods bias. We also conducted exploratory cross-cultural comparisons and performed mediation checks (fully establishing the TRA-based path in our model of attitude \rightarrow behavioral intentions \rightarrow actual behavior). We then used partial least squares (PLS) to test our hypotheses.

Figure 4 summarizes the testing of the theoretical paths in the model. Variance explained is indicated for each construct as R^2 . The path coefficients, or betas, are indicated on the paths between two constructs, along with their direction and significance. The significance of the path estimates was calculated using a bootstrap technique with 200 resamples. Table 3 summarizes the hypotheses, the path coefficients, and the t -values for each path. We also explored the use of four covariates against attitudes (participants' age, gender, education, and status as a privacy victim), which are also accounted for in these results.

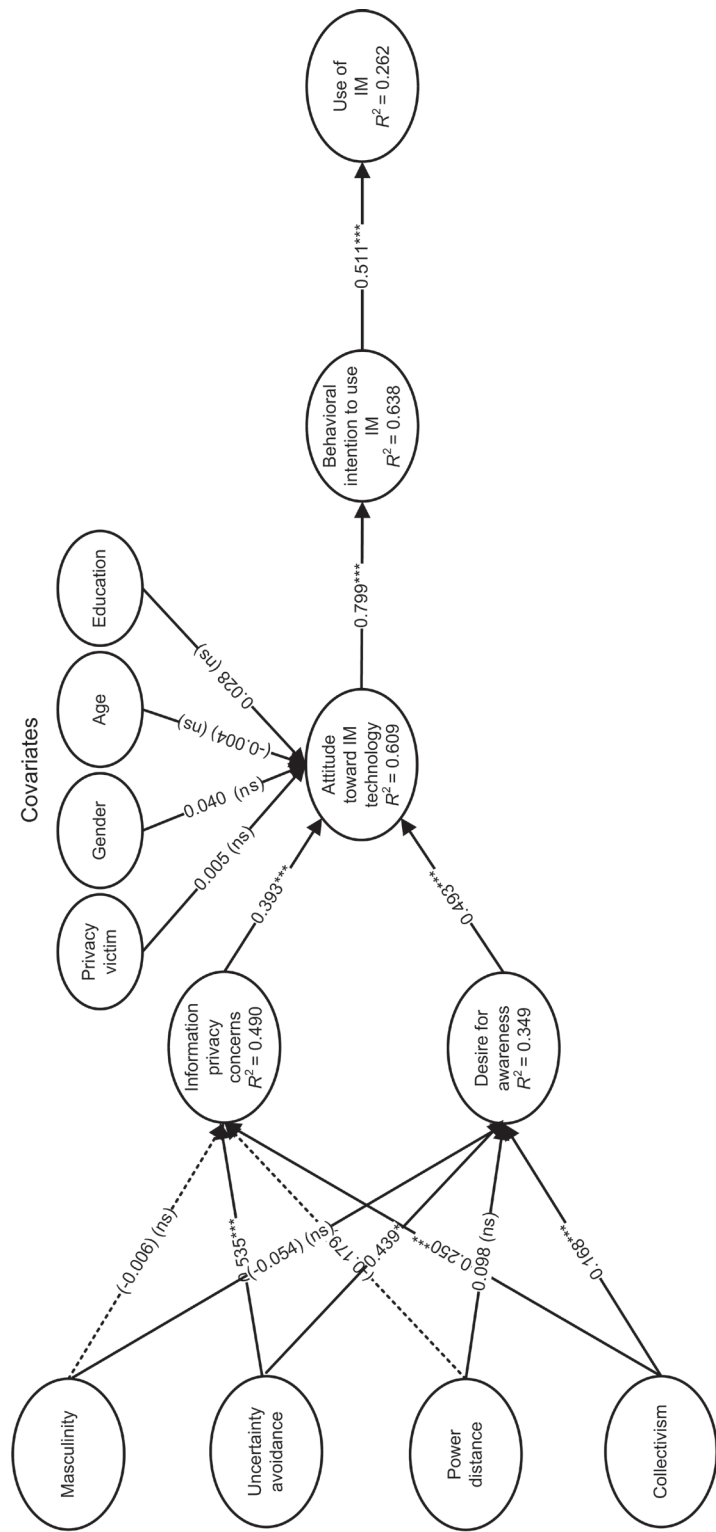


Figure 4. Full Final Model Tests (United States and China Combined)

***: $p < 0.001$; **: $p < 0.01$; *: $p < 0.05$; ns = nonsignificant.

Table 3. Combined Model: Summary of Path Coefficients and Significance Levels

Tested path	Path coefficient	<i>t</i> -value (df = 486)
Hypotheses		
H1a: Masculinity → (–) information privacy concerns	–0.006	0.15 ^{ns}
H1b: Power distance → (–) information privacy concerns	–0.179	3.04 ^{**}
H1c: Uncertainty avoidance → information privacy concerns	0.535	9.54 ^{***}
H1d: Collectivism → information privacy concerns	0.250	5.58 ^{***}
H2a: Masculinity → desire for online awareness	–0.054	0.15 ^{ns}
H2b: Uncertainty avoidance → desire for online awareness	0.439	5.73 ^{***}
H2c: Power distance → desire for online awareness	0.098	1.79 ^{ns}
H2d: Collectivism → desire for online awareness	0.168	2.52 [*]
H3: Information privacy concerns → attitude toward IM technology	0.393	8.45 ^{***}
H4: Desire for online awareness → attitude toward IM technology	0.493	11.49 ^{***}
H5: Attitude toward IM technology → behavioral intention to use IM	0.799	31.36 ^{***}
H6: Behavioral intention to use IM → use of IM	0.511	9.81 ^{***}
Covariates		
Privacy victim → attitude toward IM technology	0.005	0.17 ^{ns}
Gender → attitude toward IM technology	0.040	1.32 ^{ns}
Age → attitude toward IM technology	–0.004	0.11 ^{ns}
Education → attitude toward IM technology	0.028	0.80 ^{ns}

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; ns = nonsignificant.

U.S. Versus Chinese Models

Because we found cross-cultural equivalence in our constructs and methodology, but found national-level cultural differences in our data, we also created two different path models to make cross-cultural, multigroup comparisons possible. Table 4 compares the resulting path coefficients and *t*-statistics between the United States and China.

To statistically compare the U.S.-only and China-only path models, we used the established approach to multigroup comparisons in PLS as demonstrated in Moores and Chang [79]. Accordingly, we used a pooled standard error term *t*-test to determine the statistical significance of all the path coefficients (β s) of the U.S. and Chinese samples. We used the Smith-Satterthwaite test because our data were not normally distributed (except for two measures), and variances of the comparison groups were not equal. Table 5 summarizes these multigroup comparisons.

Table 4. U.S. Versus Chinese Models: Summary of Path Coefficients and Significance Levels

Tested path	United States β	United States t -value ($df = 202$)	China β	China t -value ($df = 284$)
Hypotheses				
H1a: Masculinity \rightarrow (-) information privacy concerns	-0.215	2.82**	0.030	0.61 ^{ns}
H1b: Power distance \rightarrow (-) information privacy concerns	-0.326	4.21***	-0.178	2.61*
H1c: Uncertainty avoidance \rightarrow information privacy concerns	0.243	1.68 ^{ns}	0.232	9.16***
H1d: Collectivism \rightarrow information privacy concerns	0.184	2.08*	0.606	3.64***
H2a: Masculinity \rightarrow desire for online awareness	-0.132	1.40 ^{ns}	0.052	0.66 ^{ns}
H2b: Uncertainty avoidance \rightarrow desire for online awareness	0.126	1.67 ^{ns}	0.189	5.10***
H2c: Power distance \rightarrow desire for online awareness	0.037	0.38 ^{ns}	0.050	1.01 ^{ns}
H2d: Collectivism \rightarrow desire for online awareness	0.167	1.46 ^{ns}	0.472	2.21*
H3: Information privacy concerns \rightarrow attitude toward IM technology	0.305	5.13***	0.420	5.72***
H4: Desire for online awareness \rightarrow attitude toward IM technology	0.575	9.73***	0.429	6.41***
H5: Attitude toward IM technology \rightarrow behavioral intention to use IM	0.771	21.11***	0.806	22.43***
H6: Behavioral intention to use IM \rightarrow use of IM	0.720	21.52***	0.380	5.16***
Covariates				
Privacy victim \rightarrow attitude toward IM technology	-0.07	1.55 ^{ns}	-0.005	0.14 ^{ns}
Gender \rightarrow attitude toward IM technology	-0.025	0.56 ^{ns}	0.044	1.13 ^{ns}
Age \rightarrow attitude toward IM technology	-0.075	1.21 ^{ns}	0.043	0.99 ^{ns}
Education \rightarrow attitude toward IM technology	-0.055	0.98 ^{ns}	0.058	1.57 ^{ns}

***: $p < 0.001$; **: $p < 0.01$; *: $p < 0.05$; ns = nonsignificant.

Table 5. Results of Multigroup Comparisons of All Paths Between National Cultures

Path	United States		China	
	β	Standard error	β	Standard error
H1a: Masculinity \rightarrow (-) information privacy concerns	-0.215	0.0764	0.030	0.0494
H1b: Power distance \rightarrow (-) information privacy concerns	-0.326	0.0774	-0.178	0.0682
H1c: Uncertainty avoidance \rightarrow information privacy concerns	0.243	0.1098	0.232	0.0662
H1d: Collectivism \rightarrow information privacy concerns	0.184	0.1167	0.606	0.0637
H2a: Masculinity \rightarrow desire for online awareness	-0.132	0.0764	0.052	0.0785
H2b: Uncertainty avoidance \rightarrow desire for online awareness	0.126	0.0999	0.189	0.0926
H2c: Power distance \rightarrow desire for online awareness	0.037	0.0974	0.050	0.0494
H2d: Collectivism \rightarrow desire for online awareness	0.167	0.0866	0.472	0.0856
H3: Information privacy concerns \rightarrow attitude toward IM technology	0.305	0.0594	0.420	0.0735
H4: Desire for online awareness \rightarrow attitude toward IM technology	0.575	0.0591	0.429	0.0670
H5: Attitude toward IM technology \rightarrow behavioral intention to use IM	0.771	0.0365	0.806	0.0359
H6: Behavioral intention to use IM \rightarrow use of IM	0.720	0.0335	0.380	0.0736

* *t*-statistics are significant at $p < 0.05$.

Discussion

RQ1: What are the cultural dimensions that drive privacy concerns and desire for awareness in online SD, and will these be different between distinct national cultures?

Our combined model of U.S. and Chinese data resulted in several confirmed hypotheses concerning the effect of culture on IM usage. Uncertainty avoidance (H1c) and collectivism (H1d) increased information privacy concerns, power distance decreased information privacy concerns (H1b), and uncertainty avoidance (H2b) and collectivism (H2d) positively increased desire for online awareness. Only the hypotheses concerning masculinity (H1a and H2a) and power distance (H2c) had unexpected results. Masculinity failed to have any effect on information privacy concerns (H1a) and desire for online awareness (H2a), whereas power distance showed no effect on desire for online awareness (H2c). Notwithstanding the mixed results concerning masculinity/femininity, it is clear that culture—as espoused by uncertainty avoidance, power distance, and collectivism—plays an important role in driving privacy concerns and desire for online awareness in the context of online SD.

We provided substantial evidence of cross-cultural equivalence in our constructs and methodology. Thus, our exploratory analysis showing several important measurement differences between the national cultures in our sample can most likely be explained by the differences in national cultures rather than by artifacts of our data collection. This exploratory analysis showed that the Chinese participants had higher collectivism, power distance, and masculinity than the U.S. participants, all of which aligns with prior research on national culture (e.g., [71, 126]).

Because of the underlying differences between the national cultures in our study, we felt that it was prudent to conduct further analysis comparing path models for each culture to test the generalizability of both models across these two different national cultures. This comparison of the U.S.-only model and the China-only model yielded further confirmatory results with only slight differences between the models. Thus, we conclude that our findings are highly generalizable across national cultures that lean toward either collectivism and high power distance (e.g., China) or individualism and low power distance (e.g., the United States).

Using multigroup comparisons for PLS, we statistically compared the strength of the paths between the U.S. and Chinese models, and this comparison provided important insights into other key cultural differences. This analysis showed that collectivism played a stronger role in the Chinese sample than in the U.S. sample as far as positively affecting information privacy concerns and desire for online awareness. Masculinity played a stronger role in the U.S. sample than in the Chinese sample regarding negatively affecting information privacy concerns. Behavioral intention to use IM, on the other hand, played a stronger role in positively affecting the U.S. sample than it did in the Chinese sample.

In terms of gender, power distance and masculinity were higher for men. Conversely, information privacy concerns were higher for women.

RQ2: Which is a stronger driver of the use of SD technologies, privacy concerns or desire for awareness? The underlying TRA-based model with information privacy

Table 6. Common Results of the Cross-Cultural Model Comparison

Shared U.S. and Chinese Results	Significant differences in the strengths of the paths?
Information privacy concerns positively affect attitude toward IM.	No, equal effect for both cultures
Desire for online awareness positively affects attitude toward IM.	No, equal effect for both cultures
Attitude toward IM positively affects behavioral intention to use IM.	No, equal effect for both cultures
Behavioral intention to use IM positively affects the use of IM.	Yes, stronger for the U.S. model
Collectivism positively affects information privacy concerns.	No, equal effect for both cultures

concerns and desire for online awareness fully holds in both cultures. We hypothesized that information privacy concerns and desire for online awareness would positively affect attitude toward IM (H3 and H4). The attitude toward IM would then positively affect behavioral intention to use IM (H5) and the intention would positively affect the actual use of IM (H6). All these hypotheses were supported in the combined model and the separate U.S.-only and China-only models. Although information privacy concerns and desire for online awareness have significant effects on the attitude toward IM, desire for awareness has a higher path coefficient than privacy concerns—suggesting desire for awareness is the stronger driver of the two.

RQ3: Are there key cross-cultural differences that drive SD technology use in distinct national cultures? Are there cross-cultural differences in privacy concerns, desire for awareness, and SD technology use? We found that the results shared in common by these models supported the generalizability of our hypotheses for the core elements of awareness, privacy concerns, and the use of IM. In both the U.S. and the Chinese models, we found that information privacy concerns and desire for online awareness positively affect attitude toward IM. Attitude, in turn, positively affects the intention to use IM and then the intention positively affects the actual use of IM. Conversely, behavioral intention to use IM played a stronger role in positively affecting the actual use of IM in the U.S. sample than in the Chinese sample. Furthermore, the Chinese participants had a higher desire for online awareness but a lower attitude toward intent to use and the actual use of IM. Meanwhile, the key cross-cultural determinants of information privacy concerns and desire for awareness vary on the cultural dimensions. Table 6 summarizes the results that were shared across the two cross-cultural models, and thus are likely generalizable to different national cultures.

Finally, we found that several results were different between the samples. Specifically, we found that in the Chinese sample, uncertainty avoidance positively affects information privacy concerns; this relationship was shown in the same direction in the U.S. sample but was not significant. In the Chinese sample, uncertainty avoidance

Table 7. Summary of Uncertain Cross-Cultural Results

Area of difference	Direction difference?	U.S. results	Chinese results
Uncertainty avoidance → information privacy concerns	No (both positive)	Uncertainty avoidance has no effect on information privacy concerns (though in positive direction)	Uncertainty avoidance positively affects information privacy concerns
Uncertainty avoidance → desire for online awareness	No (both positive)	Uncertainty avoidance has no effect on desire for online awareness (though in positive direction)	Uncertainty avoidance positively affects desire for online awareness
Collectivism → desire for online awareness	No (both positive)	Collectivism has no effect on desire for online awareness (though in positive direction)	Collectivism positively affects desire for online awareness

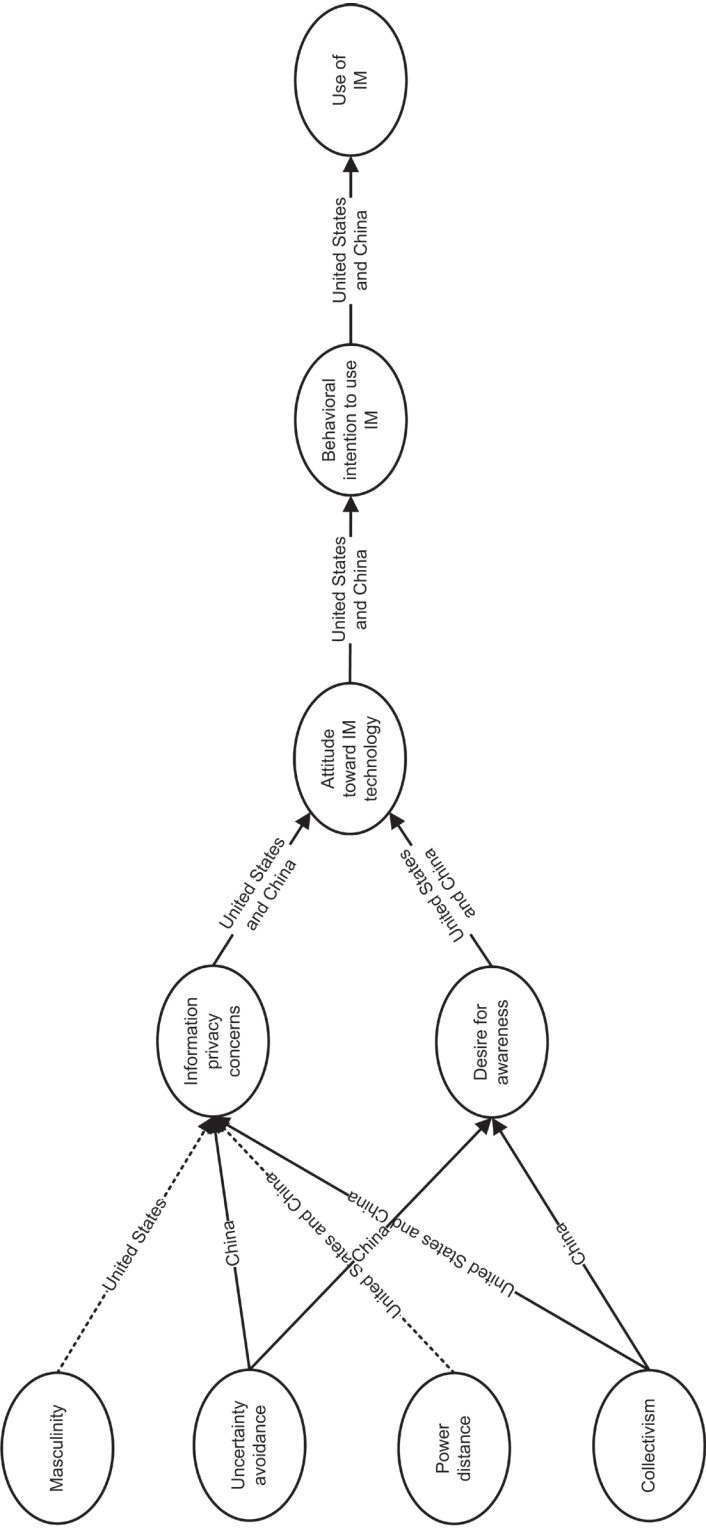


Figure 5. Final Proposed Cross-Cultural Model

and collectivism positively affected desire for online awareness; in the U.S. sample, both paths were in the same direction but were not significant. These results indicate that uncertainty avoidance and collectivism are more important factors for the Chinese participants than the U.S. participants. Table 7 summarizes these uncertain results. These combined results lead us to propose a revised theoretical model as depicted in Figure 5.

Contributions to Research and Practice

This study established a theoretical model—based on social exchange theory and the theory of reasoned action—that explains the relationships among cultural dimensions, information privacy concerns, desire for online interpersonal awareness, attitude toward SD technologies, behavioral intention to use SD technologies, and actual use of SD technologies. Although the model was tested with just one specific SD technology—instant messaging—an extant literature review and additional empirical testing lead us to believe that IM is the strongest form of SD technology allowing the fullest control over the SD process and the strongest support for privacy protection and awareness.

Our findings confirm previous research claims that concern for privacy and desire for awareness in a CMC context are likely to vary according to different cultural dimensions because CMC is global in nature [55, 59, 77, 78]. We also conclude that the control features of IM make it attractive for people who desire information privacy and awareness. Our model and findings challenge the notion that SD technologies would not be used by those who desire privacy. In actuality, as a medium that allows a wide range of control over interaction and privacy, IM is a strong choice for those desiring privacy. Such findings are somewhat similar to the recently highlighted “privacy paradox” phenomenon in which individuals state privacy concerns but behave in ways that seemingly contradict their statements [2]. For example, through an experimental study, Berendt et al. [10] demonstrated that Web users do not always act in line with their stated privacy preferences, sometimes disclosing information about themselves without any compelling reason to do so. An existing explanation for such a privacy attitude/behavior dichotomy is that users’ privacy decision processes are affected by bounded rationality [2, 3]. Our study results add another plausible explanation to this “privacy paradox” by emphasizing the impact of control over interaction and privacy. Therefore, our results suggest that developers of SD technologies should consider adding additional control features to applications. Doing so has the potential to increase the use of the application by increasing users’ perception of control. Likewise, managers could educate individuals about the control and awareness features of SD applications and likely achieve more use of the technology across various cross-cultural work settings.

However, in applying and testing the model in two distinct national cultures, we found key cross-cultural differences that drive IM use in distinct national cultures. The results of this portion of our study should caution practitioners that cross-cultural communication using SD technologies could potentially produce conflict because of cultural differences in SD technology use. The results of this study, on the other

hand, also suggest how practitioners can reduce such potential cultural barriers and promote SD technology use in multicultural settings, thereby benefiting from the SD technologies. By understanding people's feelings about the potential areas of conflict, managers and policymakers could develop protocols, expectations, and training to regulate the use of SD technologies.

The results of this study may also be beneficial in aiding SD technology providers in promoting these technologies and making market expansion decisions by suggesting ways in which cultural factors might influence SD technology use. For example, advertising campaigns using an SD application such as IM would likely be more effective if control features of the SD application were marketed to individuals with high collectivism.

Limitations and Future Research

Our study's limitations naturally point to future research opportunities. First, the participants in our study were relatively young, educated, and savvy in their SD technology use. Thus, we would expect some differences with those who are inexperienced with or fearful of SD technologies where privacy concerns would likely have a negative effect on IM attitudes. Rather than seeing IM as a communication medium that provides high levels of control and privacy protection (compared to alternatives such as e-mail and face-to-face conversations), an inexperienced IM user may perceive a privacy threat simply due to a lack of knowledge and experience or due to a lack of computer self-efficacy and personal innovativeness.

In addition, a younger, more technologically savvy population would likely be used to, and thus value more highly, the awareness benefits of IM. Such a population would also be much more capable of effectively using the awareness features of IM services. This experience bias exists in our sample. Future research should examine whether significant discrepancies are found among users with differing levels of IM experience; if so, those who lack experience might require different kinds of marketing, interventions, and training to encourage IM use.

As a further potential complication of the privacy issue, the two national cultures that we tested in our model—China and the United States—also have different technological and regulatory environments concerning privacy that may require further consideration. A given country's privacy social norms are complex and may not be reflected in a country's technological and regulatory structures. For example, a cross-country study of information privacy in Italy and the United States [25] included the linguistic consideration for the meaning of privacy. In this paper, we applied back-translation techniques to ensure that the word *privacy* was understood in the same way in China and the United States. We plan to evaluate the technological and regulatory structures concerning privacy in the two countries and add these structures as another set of possible predictors of privacy concerns in the future.

Finally, our theoretical model could be extended to include other possible factors. For example, a recently proposed extended model of what best predicts information privacy concerns could be added to our model [122]. Accordingly, some potentially

useful nomological extensions that could be used to predict information privacy concerns in our model could include perception of intrusion, privacy risk, privacy control, and disposition to value privacy [122]. In addition, extensions can be made based on the privacy calculus theoretical perspective in the privacy literature. The concept of “second exchange” has been introduced in Culnan and Bies [15] to explain the privacy calculus, whereby consumers’ personal information is given in return for value or benefits. This calculus aspect of privacy has been examined in various contexts in the privacy literature (e.g., [21, 25, 123]). Thus, analyzing privacy issues from this calculus perspective in the context of SD technologies, adding factors such as value or benefits to our research model, could be beneficial.

Conclusion

The purpose of this study was to propose and empirically validate a model that explains the relationships between the dimensions of culture, privacy concerns, desire for online awareness, and the use of SD technologies. Results indicate that cross-cultural dimensions were significant predictors of information privacy concerns and desire for online awareness, which were found to be predictors of attitude toward IM and, ultimately, intention to use IM and the actual use of IM. In addition, there was significant evidence that different cultures view IM use and the accompanying benefits differently, indicating that care should be taken when promoting or facilitating communication using IM or other SD technologies across cultures. Future research should be conducted to build on this study and to investigate this theoretical framework with different SD technologies and more diverse samples. Extending this theoretical framework to include other factors could also be useful in understanding the effects of culture and privacy concerns on social computing technologies in general.

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NOTES

1. In TRA, *attitude* is an individual’s summation of positive and negative feelings [4, 46].
2. Related terms are used throughout the literature, but all center on the need and desire to know what others in one’s group or social circle are doing. These include *connection* [48, 57, 111], *awareness* [16, 27, 48, 97, 120], *group awareness* [27, 57, 68, 69, 70], *presence* [1, 31, 99, 100, 111], and *workspace awareness* [39, 96, 97].
3. Examples include government, clans, and families.
4. The construct of information privacy concerns, along with its subconstructs, has been carefully established and validated; to this day, this construct is considered to be a construct with reliable measurement [122]. However, the construct was formulated before the IS community fully understood and analyzed measures as reflective or formative, as further addressed in recent

literature (e.g., [72, 93]). After examining these measures, we argue that the subconstructs should be validated as reflective because each of the items in the subconstructs is highly interchangeable. Yet, at the same time, the subconstructs of collection, error, unauthorized secondary use, and improper access refer to conceptually distinct concerns that are not interchangeable and could go in different directions. For example, it is highly plausible for one to be concerned that one's personal information is being widely stored in various databases—and thus have high collection concerns—but to feel that those who are collecting this information adequately control against accidental errors—and thus have low errors concerns. Accordingly, we argue that information privacy concerns can be reasonably modeled and tested as a second-order formative construct made of reflective subconstructs.

5. China had approximately 93 million IM users in 2005, up from about 70 million in 2004; the United States had close to 68 million IM users in 2004.

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