How and To Whom People Share: The Role of Culture in Self-Disclosure in Online Communities

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ABSTRACT

The global expansion of the use of online communities, including social networking sites, necessitates a better understanding of how people self-disclose online, particularly in different cultures. In a scenario-based study of 1,064 respondents from the United States and China, we aimed to understand how self-disclosure is affected by communication mode (face-to-face vs. online), type of relationship and national culture. Our findings show that national culture interacts with communication mode and type of relationship to affect the extent of self-disclosure. Our analysis also suggests that peoples' disclosure depends on characteristics of the relationship, e.g., closeness and openness. Our results shed new light on how online communities might be designed for users in different cultures and for intercultural collaboration.

Author Keywords

Self-disclosure, communication mode, relationship, culture, social networking sites

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Self-disclosure is a process by which people deliberately share personal information with others [8] and is a key step in the development of interpersonal relationships [3]. Through disclosure, people achieve goals of social acceptance, relationship development, and relief of distress brought on by intense experiences [28]. Self-disclosure can also have a dark side, particularly if the recipient is unhelpful or rejecting [8]. Because of the importance of self-disclosure in interpersonal relationships, scholars, including those in psychology, communication and sociology, have examined this topic for decades. Despite extensive research on self-disclosure, however, there are

several significant gaps in the literature. First, although self-disclosure occurs in a number of online contexts, including social networking systems, blogs and web forums, most CSCW and HCI research has focused on the role of anonymity [17], which may not be supported in most online communities. In online communities and social networking sites, people usually use their real identities and accurately present themselves [32]. Self-disclosure behavior, particularly using social software communication tools (e.g., online communities, blogs, social network sites, etc.) is not yet well understood. So, whether or not previous self-disclosure findings, which attribute self-disclosure to anonymity, also hold for online communities is unclear. Second, Green and her colleagues [8] call for more research on how culture and cultural norms affect disclosure, suggesting that individual differences, such as gender, have yielded valuable insights, but that we have little understanding of how different cultures conceptualize and express self-disclosure.

We are interested in the role of communication mode (e.g. face-to-face vs. online) in self-disclosure as a means of understanding relationship development via online communities. We also examine this question across cultures for two reasons. First, there has been a global expansion of the use of online communities, including social networking sites, and little is known about how these systems are or might be used in different cultures. Second, previous research shows that people from different cultures have different understandings of the meaning of self-disclosure and feelings about disclosing information [36].

In this study, we investigate 1) how self-disclosure is affected by communication mode and the closeness and openness of the relationship, and 2) if and how the patterns of self-disclosure vary across national culture. Through this research, we gain insight into how to design better online communities to support interpersonal relationship development. In particular, we aim to inform the design of online communities and social networking software to support diverse cultures and, to a lesser extent, intercultural interaction. To do so, we conducted a scenario-based study with a global IT company's employees in the U.S. and China to investigate how communication mode (face-to-

face vs. online), type of relationship and national culture affect self-disclosure. A surprising finding in our study is that neither the U.S. nor the Chinese respondents disclosed more within the online community compared to face-to-face, which is contrary to previous Computer Mediated Communication (CMC) research. Our data suggest that one possible reason for this is that people have more concerns about controlling who has access to information within online communities than they do face-to-face. Our results also demonstrate that the extent of self-disclosure depends on the closeness of the relationship between communicators. Moreover, we find that respondents from the U.S. disclose more to coworkers compared to the Chinese and this may be because those in the U.S. have more openness in their relationships with coworkers. We discuss how these findings can help the CSCW community to design better software to support communication and social networking within and across national cultures.

BACKGROUND AND RELATED WORK

Self-disclosing communication occurs when people divulge personal information to others, particularly information that would otherwise remain private and that might expose vulnerabilities [8]. As a key step in the development of interpersonal relationships [8], self-disclosure has been an important concept for researchers over the past two decades. Disclosing increases the chances of the discloser liking the recipient and can strengthen ties that people develop online and face-to-face [3, 27]. Disclosure, however, has also been associated with stress for the discloser as he or she anticipates a negative event and for the recipient who may be burdened by the knowledge [8]. Further, in a work setting, disclosure can risk compromising co-workers' perceptions of the discloser as professional and competent [19].

Self-disclosure by Communication Mode

In recent years, there has been a surge of research interest in how self-disclosure varies by communication mode [15, 34]. Communicating through an online chat room or email, for example, can lead to more self-disclosure than interacting face-to-face [15, 34]. In a recent experiment, Schouten, Valkenburg, and Peter, for example, examined the influence of instant messaging on self-disclosure. They reported that self-disclosure was higher in instant messaging than face-to-face [29].

The mechanism driving the difference between self-disclosure online and face-to-face has been attributed to different perceptions of social cues and social norms under these two communication modes [18]. In a series of studies of online chat, for example, Joinson reported that visually anonymous chat, as compared with visually identifiable chat, lead to higher levels of self-disclosure [15]. Tidwell and Walther also proposed that heightened self-disclosure during online communication may be due to people's motivation to reduce uncertainty [34]. They found that

students communicating over email displayed higher levels of self-disclosure compared with face-to-face, concluding that the limitations of email led subjects to be more direct in their questioning in order to achieve their uncertainty reduction goals. In a more recent study, undergraduate students' responding to an online survey reported that they disclosed more information about themselves on Facebook than outside of Facebook [2].

Numerous studies have reported increased disclosure online in the U.S. and also argued that anoymnity and reduced cues explain this behavior [15, 24]. In Joinson's book he discussed how being online increases self-disclosure and also attention to privacy, which seems contradictory. He concluded that self-disclosure depends on context and varies according to the target person, the process of interactions, and design of technology [16].

In our study, we were particularly concerned about online communities without anonymnity, e.g., where people interact using their real names and identities. We argue that computer mediated "identified" online communities do not lead to more disclosure than face-to-face for either U.S. or Chinese people. Regardless of anonymity, there may be other factors that affect disclosure online vs. offline. We predict, specifically, that control over third-party access to the disclosed information will be more important than anonymity in online communities because posts to online communities have the potential to be shared without the approval of the discloser. Recent research on privacy in online social networks has suggested that perception about control over who has access to information is a key element in decided whether to reveal private information [10]. Consistent with this, we hypothesize that people have more concerns about controlling third-party access to information within online communities compared to face-to-face, therefore people will disclose less in online communities.

H1a. People disclose less when communicating in an online community compared with face-to-face.

H1b. Lower self-disclosure within online communities compared to face-to-face will be mediated by concerns about control over information access.

Self-disclosure by Relationship

Key classes of information recipients (e.g., trusted colleagues, extended family, spouse, etc.) and type of information (e.g., failures, opinions, etc.) have also been identified as affecting with whom and what people are willing to share [26]. Consistent with social penetration theory, both anecdotal and empirical evidence has shown that the extent of self-disclosure depends on the relationship between communicators: The more intimate a relationship, the more in-depth the disclosure [3, 6]. We are interested in revisiting these findings, which have been tested in face-to-face contexts, in the online context. In line with previous research on face-to-face self-disclosure, we anticipate that

people will disclose most with significant others and least with strangers. We also hypothesize that the intimacy, especially the closeness and openness of the relationship, will mediate between type of relationship and disclosure.

H2a. People will disclose most with significant others, such as close family members and close friends, and least with strangers.

H2b. The closeness and openness of the relationship will mediate between type of relationship (e.g., close family members, friends, strangers, etc.) and disclosure.

Self-disclosure in Different Cultures
Cultural comparisons examining self-disclosure in online media remain limited despite significant evidence demonstrating cultural differences in human behavior [23], in general, and in communication behavior specifically. Historically, many of these cultural differences have been identified between people from Western and Eastern countries [25]. Using this as a foundation, we compare disclosure behaviors between people from the U.S. and China. In the U.S., for example, people have been shown to talk more than Chinese in collaborative tasks [34], take more turns, and work harder toward consensus [30].

Despite the shortage of studies examining cultural differences in online self-disclosure, several studies are informative. First, significant evidence suggests that North Americans disclose more, in general, than do Asians. Based on a survey comparing U.S. and Chinese students, for example, Chen reported that U.S. students disclosed more than Chinese students on a variety of topics, including politics, religion, education, social problems and world affairs under face-to-face conditions [1]. Second, a handful of studies examining cultural differences in online disclosure suggest that Asians may disclose more online than face-to-face. Ma [22], for example, found that North American and East Asian college students displayed greater self-disclosure in computer mediated as compared to face-to-face interactions.

Although Chinese people may disclose more online than face-to-face, we further suggest that there will be an interaction between mode of communication and culture such that North Americans will disclose more face-to-face than will the Chinese, but that the difference will be eliminated when interacting online. In face-to-face interactions, the Chinese are likely to be more reserved than Americans to avoid disrupting interpersonal harmony and violating social norms [11]. As Ma argues, East Asians value indirect communication as a way of preventing embarrassment and threats to "face" and that online environments feel more indirect because they are perceived to be anonymous [22]. As we argued earlier, online communities, particularly social networking sites, tend to have less anonymity than assumed by previous studies, a feature which may reduce the "worry-free" advantage of

anonymous online communication for Chinese. We therefore predict:

H3. U.S. compared with Chinese participants will disclose more when face-to-face, but have similar levels of disclosure online.

METHOD
To test our hypotheses, a scenario-based survey with a 2× 5×2 between-subject design was conducted, including three dimensions: communication mode (online vs. face-to-face), type of relationship between communicators (stranger, co-worker, co-worker who is also a good friend, close friend, close family member) and national culture (U.S. vs. Chinese).

Previous research in cultural psychology has established that a scenario-based approach is an effective way to understand cross-cultural differences (e.g., [37]). Given technology differences across the U.S. and China, scenarios are a good way to understand preferences independent of the technology participants currently have available or are using. This method is also well established within the HCI field with studies as diverse as understanding responses to breakdowns in robots [20] and examining information demands in context-aware applications [21]. In our study, we provided written scenarios describing a situation encountered by a discloser (to reduce social desirability effects of responding for oneself) and questions about whether and how this person would disclose the events of his day to a prospective recipient. The effectiveness of the scenario and some of the measures were pre-tested in a pilot study.

Pilot Study
Our pilot study was conducted to verify that the scenarios were understandable and sensitive enough to detect U.S. and Chinese respondents' disclosure preferences. We also evaluated whether or not U.S. and Chinese respondents could clearly distinguish the five levels of relationship.

The sample consisted of 13 U.S. (6 male, 7 female, M_{age}=41 years) and 13 Chinese respondents (7 male, 6 female, M_{age}=26 years) who were born, grew up and lived in the U.S. or China, respectively. All the respondents were asked to answer questions about their background to discern cultural identity (e.g., *countries in which they were raised, to what extent they identified with their own culture, etc.*), read two scenarios (see table 1), describe what they thought the person in the scenario would disclose about his day, and rate five interpersonal relationships (stranger, co-worker, co-worker who is also a good friend, close friend, close family member) on closeness and openness (7-point scales with 7 equal to more closeness and more openness). All materials were translated and back-translated by professional translators into English and Chinese.

Our pilot study results indicated that respondents in both cultures understood the scenarios and were able to answer

questions about what the discloser might be expected to do in these scenarios. Moreover, the respondent's ratings on closeness and openness increased as the relationship moved from stranger to close friend and close family and showed clear distinctions between these five relationships in both cultures.

Main Study

The main study was a survey that presented demographic questions, personality scales, a scenario followed by questions pertaining to the scenario, and questions evaluating the effectiveness of our manipulations.

In cross-cultural experiments, one significant challenge is conducting controlled research with representative samples from the cultures of interest. Cross-cultural studies often rely on Chinese students who study in U.S. universities, though the limitations of this method are widely recognized. Limitations include a possible selection bias (e.g., Chinese who come to the U.S. may not be representative of the average Chinese) and adaptation issues (e.g., Chinese students attending U.S. universities may have adapted to the U.S. culture). To address these concerns, we conducted our experiment at a global company which has employees in both the U.S. and China. All materials were presented in English for the U.S. respondents and Mandarin Chinese for the Chinese respondents. Materials were first developed in English by the entire multi-cultural research team and then translated to Chinese by a professional translator who was blind to the experimental design. Finally, consistent with practices for cross-cultural research, the materials were "back translated" into English by two other professional translators to ensure no change in meaning.

Participants

The survey request was sent via email to a total of 12,000 employees from a global IT company who were randomly chosen based on their work locations (U.S. or China). The response rate was 11.58% (1,389). We further restricted our sample by two filter questions, including where the respondent was raised and what language(s) they spoke fluently before the age of 10, to make sure the cultural

identity of each participant in this study was strictly either U.S. or Chinese. The final sample consisted of 1,064 respondents (496 U.S., 568 Chinese). There were 153 females and 343 males in the U.S. sample and 99 females and 469 males included in the Chinese sample. The mean ages of these two samples were 39.47 years (SD=9.63) for the U.S. and 30.77 years (SD=5.42) for the Chinese.

Manipulations

We have three primary independent variables in this study, including communication mode, relationship, and culture. Culture was not manipulated, but varied based on our sample of U.S. and Chinese. We then used the scenario for our remaining manipulations by changing the content of the scenario as depicted in table 1.

To evaluate the effectiveness of our manipulations, we conducted one-way ANOVAs including the control variables. To be specific, in evaluating our manipulation check for face-to-face vs. online, we found significant differences such that those in the face-to-face conditions recognized that the person in the scenario was face-to-face vs. online with the recipient of the disclosure (F[1,976]= 1397.69, p<.001). In our scenarios, we did not specify a particular online community because there is no single dominant online community that spans the U.S. and China. If we had referenced local social software in the study (e.g., Facebook in the U.S. and Renren in China), we would not have been able to determine whether the differences we found were caused by cultural differences or by different designs of the sites. This is an ongoing challenge for cross culture research on communication tools given that applications are often not designed the same way in different countries. Instead of choosing a particular online community application, we designed two questions to check if the U.S. and Chinese respondents had consistent understandings about the online community in terms of control over information access and anonymity. Our data show that there were no significant differences in perceptions of information access control (*what John chatted with this person about could be known to someone else, F*[1,526]=2.12, *p*=.15) or anonymity (*John's identity is*

Scenario: (1) is a project manager for a large company. He was recently put in charge of an important project. He worked extremely hard on the project. This morning, his boss called him into the office and **(2)**. That evening, he had an opportunity of chatting with a **(3)** and **(4)**.

Manipulations:

Cultural context	(1)	<u>U.S.</u>: John (then follows English version)	<u>China:</u> Zhang Min (then follows Chinese version)
Information valence	(2)	<u>Positive</u>: praised him for his good work. He received a promotion and a large pay raise	<u>Negative</u>: told him that his work on the project was unsatisfactory, He is being taken off the project and received a demotion and a large pay decrease
Relationship	(3)	stranger/co-worker/co-worker who is also a good friend/close friend/close family member	
Communication mode	(4)	<u>Online</u>: in an online community in which people register with nicknames	<u>Face-to-face</u>: at a gathering chatting

Table 1. Scenario (top) with the manipulations indicated by number.

	M	SD	1	2	3	4	5	6	7	8	9
1. Age	34.83	8.81	-								
2. Gender	-	-	-0.03	-							
3. Extroversion	25.19	5.44	0.08**	-0.12**	0.83						
4. Self-monitoring	10.95	4.20	-0.06*	-0.04	0.33**	0.72					
5. Net-behavior	13.37	5.25	-0.02	-0.03	0.10**	0.15**	0.71				
6. Information valence	-	-	-0.02	-0.00	0.04	0.05	0.02	-			
7. Communication mode	-	-	-0.03	0.03	-0.00	0.01	0.03	0.02	-		
8. Type of relationship	-	-	-0.01	-0.02	0.06	0.01	0.00	0.02	-0.01	-	
9. Culture	-	-	-0.49**	0.16**	-0.17**	-0.07*	-0.17**	0.01	-0.01	-0.03	-
10. Extent of disclosure	3.65	1.73	-0.08*	0.00	0.04	0.07*	0.10**	-0.03	0.06	0.32**	-0.02

$* p < .05, ** p < .01$

Table 2. Full ANOVA analysis predicting the extent of disclosure.

known by the person with whom he was chatting, (F[1,526]=0.32, p=.57) between the U.S. and Chinese respondents.

Although we did not manipulate culture, we were able to use standard measures [5] to evaluate whether respondents' self-construals were different between cultures. Marcus and Kitayama describes Americans as having *independent* self-construals (a person who sees him/herself as unique with dispositional attributes that are independent of the relationships and contexts in which s/he is embedded) and Chinese as having *interdependent* self-construals (a person who sees him/herself as defined by the relationships and contexts s/he inhabits) [23]. Results show that the main effect of culture on self-construal was significant, (*F*[1,926]=22.75, *p*<.001), with the self-construal of the U.S. respondents (*M*=54.26, *SD*=10.31) being more independent than that of the Chinese (*M*=57.88, *SD*=9.66), as expected. All except our relationship variable were dichotomous. Relationship was treated as both a continuous variable, with 1=*stranger* and 5=*close family member*, and a nominal variable, with the same pattern of results. Unless otherwise indicated, we report the correlations and ANOVA tests for relationship as a continuous variable.

Dependent Variables
To test our hypotheses, we measured as our dependent variable the extent of disclosure that respondents predicted following the scenario. After presenting the scenario, we asked a question about the extent to which the discloser in the scenario would disclose to some specific others details about the events of his day (on a 7-point scale anchored by 1=*not at all* and 7=*very much)*.

Control Variables
A consistent finding in the literature on self-disclosure is that females disclose more than males [4]. Dindia and Allen's study, for example, shows that the gender difference in self-disclosure varies when respondents disclose in different relationships (stranger, friend, parent or

spouse). Females and males disclose similarly to a stranger whereas females disclose more in other relationships [7]. In our study we set gender as a control variable for all analysis.

According to previous work, the extent of self-disclosure is also influenced by whether the information is positive or negative, with people generally preferring positive self-disclosure to negative [33]. Not all evidence, however, favors positive disclosure. Pasupathi et al. [28], for example, studied the nature of what people disclose about their life experiences and found that respondents regularly disclose information about everyday negative events, although people were less likely to disclose negative events of more significance. In our study, we provide both positive and negative scenarios by manipulating the contents and set information valence as a control variable.
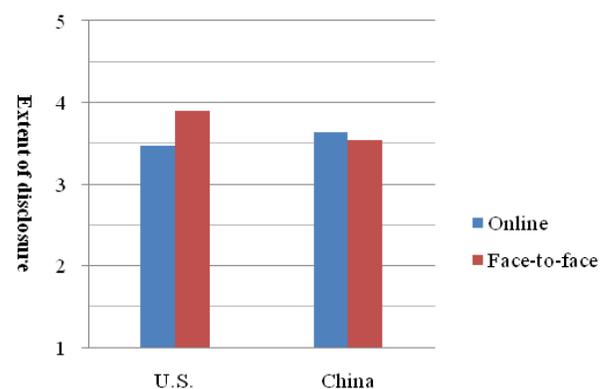
Figure 1. Extent of disclosure by communication mode and culture.

Previous studies of face-to-face disclosure indicate that the extent of disclosure may be sensitive to personal characteristics (e.g., extroversion or self-monitoring) (see [3]). We therefore measured these two factors as control variables in all of our analysis using the extroversion scale

[14] (α=0.83) and the self-monitoring scale [31] (α=0.72), respectively.

Considering the possible influence of one's current and past online experience on his/her online disclosure, we also measured respondents' online experience. We averaged across four items to create an online experience scale (α=0.71) and set it as a control variable in our analysis. Age is also set as a control variable in our analysis.

RESULTS

Table 2 shows the descriptive statistics and correlations between the primary variables in this study. To test our hypotheses, a 2×5×2 (communication mode [online, face-to-face] × relationship [stranger, co-worker, co-worker who is also a good friend, close friend, close family member] × 2 culture [U.S., Chinese]) ANOVA analysis was conducted to predict the extent of disclosure.

Self-disclosure by Communication Mode and Culture

Although the main effect of communication mode was not significant (F[1,979]=1.97, p=.16), the 2-way interaction between communication mode and culture was significant when predicting the extent of disclosure, F[1, 979]=5.64, p=.02 (see figure 1). The test of the simple main effect of communication mode shows that the U.S. respondents anticipated more disclosure when face-to-face compared to online (F[1,449]=5.97, p=.02), but there is no such difference for the Chinese (F[1,530]=0.49, p=.48). Thus, our findings provide partial support for hypothesis 1a in which we argued that people will disclose less when communicating in an online community as compared to face-to-face, but this result only held for US and not Chinese respondents. This analysis also provides insight into hypothesis 3a in which we argued and found that U.S. respondents would disclose more than Chinese respondents when face-to-face, but have similar levels of disclosure online. For online disclosure, there was no significant difference between the U.S. and Chinese respondents (F[1,509]=0.15, p=.70) whereas for face-to-face disclosure, the Americans disclosed significantly more compared to the Chinese (F[1,470]=5.18, p=.02).

These results are consistent with our predictions, but in contrast to previous research which shows that North Americans disclose more online compared to face-to-face no matter whether on CMC [15] or Facebook [2], and Chinese disclose more online compared to face-to-face [22]. We argued that previous research emphasizing anonymity would be overshadowed by current privacy concerns, particulary about having control over who has access to the information disclosed. Consistent with this, in our study context, anonymity did not explain disclosure behavior. Our respondents reported that neither online (M=4.85, SD=1.82) nor face-to-face (M=5.57, SD=1.72) was anonymous when asked the extent to which they thought that the discloser could be identified (1=*disagree strongly* and 7=*agree strongly*) although respondents perceived online to be more anonymous. There was no significant difference between the U.S. and the Chinese respondents in perceptions of anonymity (F[1, 977]=1.19, p=.28]. Further, in a mediation analysis, anonymity was not found to mediate the relationship between communication mode, culture, or the interaction between the two when predicting disclosure.

We hypothesized in H1b that concern over controlling access to information would have more explanatory power in determining disclosure in online communities. In support of H1b, we found that perceived control over information access mediated the relationship between communication mode by culture and the extent of disclosure. The U.S. respondents in our study had significantly more concerns about content being known to others when online compared to face-to-face (F[1,450]=7.46, p=.01), but this difference was not detected for the Chinese (F[14,530]=.02, p=.89). We tested the mediating effect of control over access to information and found that it was significant. That is, the interaction between communication mode and culture predicted the extent of disclosure, but when "control over access" was added to the model, control over access was significant and the relationship between communication mode/culture and disclosure became insignificant (see figure 2).

We therefore conclude that people have different levels of concern about others having access to information they disclose in online communities compared to face-to-face, which may lead to different levels of self-disclosure in these two modes. Our data suggest that the U.S. respondents had more concerns about what was said being known to others online compared to face-to-face and this was associated with predictions of less disclosure online. The Chinese did not show this difference and anticipated similar levels of disclosure when online and face-to-face, which supports our Hypothesis 1b.

Self-disclosure by Relationship and Culture

An ANOVA analysis reveals a significant main effect of relationship on self-disclosure, F[4, 979]=30.10, p<.001). That is, the extent of self-disclosure increases when people disclose in more intimate relationships, from strangers to co-workers, co-workers who are also good friends, close friends and close family members. Neither the main effect of communication mode nor national culture was significant, which shows that to whom people disclose is a key factor in determining self-disclosure in our sample.

This disclosure pattern holds across U.S. and Chinese respondents. So, our Hypothesis 2a, in which we argued that people will disclose more with more intimate others, is supported. We tested the extent to which closeness mediated between relationship type and disclosure and found that it did, thus also partially supporting Hypothesis 2b. The significance of the association between relationship and extent of disclosure diminishes once closeness is added

to the model (from $F[4,979]=30.10$, $p<.001$ to $F[4,975]=1.23$, $p=.30$), suggesting that closeness may pay a significant role in explaining the association between relationship and extent of disclosure. The openness of the relationship, however, did not mediate between relationship intimacy and extent of disclosure.
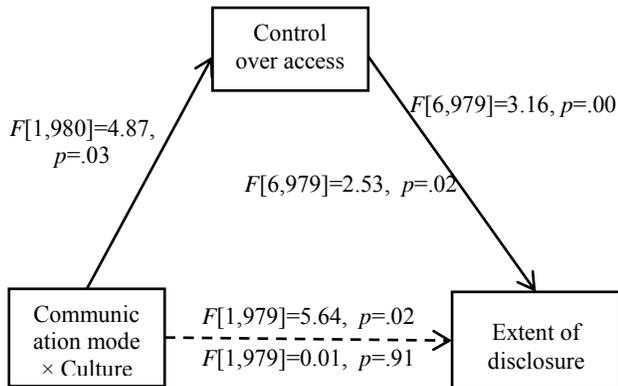
Figure 2. Control over access as a mediator between the interaction of communication mode and culture and extent of disclosure.

Given that we have five types of relationship, and ANOVA is often insufficient for full interpretation of the effects of independent variables on the dependent variable when there are more than three levels, we used orthogonal comparisons to explore the interaction between relationship and national culture.

For the U.S. respondents, the highest level of disclosure was with close family members, close friends and a coworker who is also a good friend ($M=4.26$, $SD=1.64$; $M=4.05$, $SD=1.75$; $M=3.90$, $SD=1.66$, respectively). U.S. respondents predicted the least disclosure with strangers
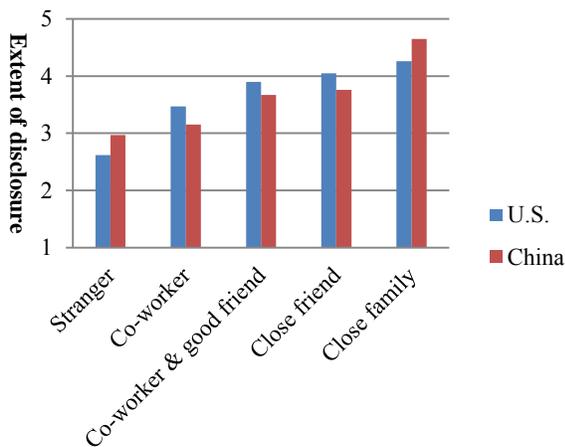
Figure 3.   The influence of relationship on the extent of disclosure between cultures.

($M=2.62$, $SD=1.69$; $p=.00$). These four relationships were similar between the U.S. and Chinese respondents with Chinese respondents also predicting the highest levels of disclosure with close family members ($M=4.65$, $SD=1.61$), close friends ($M=3.76$, $SD=1.71$) and coworkers who are also good friends ($M=3.67$, $SD=1.61$; $p=.01$) and the least disclosure with coworkers and strangers ($M=2.97$, $SD=1.71$).

As can be seen from figure 3, there was some difference between U.S. and Chinese respondents' view of co-workers who were not good friends ($F[1, 204]=4.06$, $p=.05$). The Chinese treated these co-workers more as strangers whereas the US respondents predicted significantly more disclosure to co-workers than strangers. We conducted further analysis and found that the U.S. and Chinese respondents had similar perceptions of the co-worker relationship in terms of closeness, but that the U.S. respondents had significantly more openness to coworkers than did the Chinese ($F[1,211]=4.58$, $p=.03$). Openness, in fact, mediated the relationship between culture and disclosure in the co-worker relationship, suggesting that openness mediates the relationship between national culture and disclosure with co-workers, although not in other types of relationships.

DISCUSSION

Despite the global expansion in the use of social software, many applications are designed largely based on Western assumptions about social behavior [9, 12]. As online communities become increasingly important and social networking systems are rapidly adopted across the globe, research examining online self-disclosure in different cultures needs to keep pace. In our research, we strove to understand the role of culture in self-disclosure as a foundation for the future development of online communities, especially social networking sites. Our results demostrate that there are significant cultural differences in how and to whom people disclose and have implications for the design of social networking systems that will be used by people from different cultures.

Consistent with our predictions, but different from previous research, we found that U.S. respondents predicted more disclosure when face-to-face compared to online and Chinese predicted similar disclosure when comparing face-to-face vs. online. We hypothesized and found that peoples' concern about control of third-party access to information is a possible explanation for the extent of disclosure. The U.S. respondents had more concerns about content being known by others within online communities and this was associated with a decrease in online disclosure. Although the Chinese in our study exhibited the same concern, they showed more concern about third-party access to information when face-to-face than did the US participants. If concern about control over access to information explains differences in disclosure by mode, why then do the Chinese participants disclose equally over face-to-face and online?

Although speculative, we posit that that Chinese participants' experience with online media is different than U.S. participants' experience and, as a result, U.S. respondents have more privacy concerns. At the same time, Chinese may have more experience with privacy violations in face-to-face disclosures. Our research hypotheses are summarized in table 3.

In sum, our results clearly suggest a difference between U.S. and Chinese respondents' reaction to control over access to information, but additional research is needed to understand how this interacts with other factors and whether these differences are the result of cultural communication preferences (e.g. indirectness), participants' experience with local technology, or the local cultural (e.g. political) context.

Given these insights, we suggest that online communities should provide features to enable users to control third-party access to information. Facebook, Renren and Google Plus provide features for users to put different contacts into groups and customize privacy settings for each group. Users, however, have no control over whether the shared information can be disseminated further. We suggest social software provide users the option to define the parameters for sharing information with third parties. People, for example, could specify for a particular piece of information whether or not it could be passed on to others, to whom it could be shared, and how broadly. Users might be willing to disclose more if they are able to easiliy control whether or not the content can be shared further. Based on our findings, we anticipate that such features will reduce users' concerns and thus encourage more disclosure in both US and Chinese populations, although the effect may be strongest among US users.

Previous research on self-disclosure has primarily focused on the role of self-disclosure in relationship construction and development. As such, the recipient of disclosure and nature of the relationship has been identified as an important factor in the decision of how much to disclose. This factor, however, has not been included in most self-disclosure research examining communication over electronic media. One aim of our research was to understand self-disclosure by examining communication mode and relationship in a single study.

Looking at disclosure patterns across relationship types, we found that disclosure to co-workers was comparable to disclosure to strangers for the Chinese respondents. We also found that different disclosure levels for U.S. and Chinese respondents to coworkers were mediated by openness. There was a strong positive relationship between openness and disclosure with co-workers for U.S. respondents (F[6, 96]=8.99, $p=.00$), but not so with Chinese respondents (F[6,115]=1.35, $p=.24$). In fact, the relationship for Chinese respondents was, surprisingly, slightly negative such that

H1a.	*People disclose less when communicating in an online community compared with face-to-face. PARTIALLY SUPPORTED.*
H1b.	*Lower self-disclosure within online communities compared to face-to-face is mediated by concerns about control over information access. SUPPORTED.*
H2a.	*People will disclose most with significant others, such as close family members and close friends, and least with strangers. SUPPORTED.*
H2b.	*The closeness and openness of the relationship will mediate between type of relationship (e.g., close family members, friends, strangers, etc.) and disclosure. PARTIALLY SUPPORTED.*
H3.	*U.S. compared with Chinese participants will disclose more when face-to-face, but have similar levels of disclosure online. SUPPORTED.*

Table 3. Summary of research hypotheses

Chinese respondents predicted less disclosure with co-workers with whom they reported openness.

Our findings indicate that increasing openess may increase disclosure among American co-workers, but not among Chinese co-workers. How could an organization, if they so desired, enable more disclosure? Our results show that Chinese disclose significantly more to a co-worker who is also a good friend as compared with a co-workers who is not a good friend, which suggests that a friendship tie between co-workers may be instrumental in increasing sharing for Chinese. This insight echoes Yuki's work in which Americans trusted ingroup members (e.g. co-workers) more than outgroup members (e.g. strangers) but trust for the Japanese depended largely on friendship ties. [37]. We therefore suggest that social software could highlight shared personal interests, shared group memberships, and the longevity of the tie which could help increase the perception of friendship.

Our findings become particularly relevant when thinking about global teams and can inform the design of applications that support intercultural communications between global team members. For enterprise social networking systems, for example, in which self-disclosure may be desired for promoting collegial work relationships, systems could provide ways to create more of a sense of "interpersonal connection," especially for those who generally do not favor sharing with coworkers, such as the Chinese in our study. If social networking systems could make visible the group identities that are shared and/or the relational ties that bind workers, self-disclosure among coworkers may be enhanced. Of course, this suggestion should be taken with healthy skepticism because it assumes that disclosure is desireable and will facilitate collaboration across cultural groups.

Disclosure, for example, is not always preferred. Based on our results, an American might disclose things that make her Chinese co-worker feel uncomfortable due to asymmetric disclosure preferences between the U.S. vs. China. To facilitate more appropriate disclosure, enterprise social networking software could remind users of the disclosure norms when sharing information with co-workers from distant locations. For example, when an American discloses to a Chinese co-worker, the application could detect the extent of disclosure and automatically remind the American if the disclosure extent violates the norms for disclosure in China. Alternatively, to avoid cultural stereotypes, users could indicate the extent to which they are receptive to personal disclosure and the system could flag postings that cross over this line. Social networking systems could also learn about others' preferences based on their own disclosure behavior and their reactions to others' disclosure to set desired disclosure levels. These features are ambitious, but we hope are provocative and trigger ideas for short as well as long-term development. Leveraging technology to improve intercultural collaboration is a long journey and will likely require significantly more research and technology advances to achieve some of these goals.

Despite the advances made by this research, there are, as always, limitations. One limitation is that we used a scenario-based survey rather than observing actual self-disclosure behavior, so our data reflects the norms that people believe are followed, but we cannot guarantee that this matches behaviors. To validate the results of our study, it would be useful to collect behavioral data. One viable data collection approach might be to study an enterprise social networking system that is deployed in multiple countries as a means of keeping the technology constant and studying variations in behavior across cultures. Another limitation is that we sampled employees at a global company headquartered in the U.S. As such, the Chinese respondents undoubtedly have more exposure to U.S. culture compared to the average Chinese person. We believe that this is a conservative test of our hypotheses since Chinese with less exposure to U.S. culture are expected to differ even more from the U.S. sample. Still, it is critical to evaluate these findings with additional samples that are more reflective of the average Chinese (and the average person from the U.S.). Finally, our study focused on disclosers and recipients, but not on the social networks within which they were embedded, except to the extent that sharing with third-parties surfaced as a concern. To fully understand cultural differences in the use of social networking systems, further research that explores behaviors within the larger network is essential. Overall, we believe that these results advance our understanding of how online communities, including social networking systems, may be designed to faciliate or inhibit disclosure and, as a result, support relationship development. They also advance our understanding of how these systems might account for cultural differences.

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