

From Privacy Concern to Uses of Social Network Sites: A Cultural Comparison via User Survey

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Abstract— Individuals from different regions normally bear different cultural norms and values, and these variations would in turn affect their behavior and attitude with the computing system. However, though the cross-cultural study has been performed in other areas (e.g., e-commerce websites), few have identified its influence on users' behavior in social network sites (SNS). With the increasing popularity of SNS (e.g., Facebook) worldwide, especially in Asian region, we are interested in revealing the effect of culture variables on users' privacy concern and trust in SNS, and furthermore their influence on users' usage motivation, actual uses, overall attitudes and future behavior intentions. This paper presents the in-depth analysis of results from an online survey, which indicates the significant differences between Hong Kong and French SNS users, in respect of various measures. Moreover, it shows that for predicting a user's usage pattern, her/his culture value should be considered since the predictors are different between the two cultural groups.

Keywords - Social network site, privacy concern, trust, usage behavior, cultural differences

I. INTRODUCTION

Social network sites (SNS) have grown faster than ever in a global scale. The geographic boundaries are no more obstacles for their growth and development, as the Internet provides a media to enable massive amount of information to flow across borders. There is also a tendency for SNS providers to internationalize their business, making its platform available worldwide. For instance, Facebook is now available in more than 70 translations and reached 500 million active users around the world. As an example, it has become very popular in Hong Kong since 2007 and has around 3.6 million users (52.2% of population) till March 2011. However, the internationalization process is still a complex task, since the adaption to different cultural contexts has often been regarded as the key factor for a global business to succeed [5,6].

Culture, which is always referred to the shared perception of social environment, actually shapes the way individuals behave, interact, and build relationships with others [12,13,16]. One of the well-known and widely applied frameworks to describe the cultural differences is that proposed by Hofstede [15]. His framework constitutes four indices to measure the cultural values, which are Power Distance Index (PDI), Individualism (IND), Masculinity (MAS) and Uncertainty Avoidance Index (UAI). Among these values, IND and UAI are indicated to play a major role in the formation of users' privacy concern [24]: IDV refers to the degree of individualism; and UAI measures the level of tolerance for ambiguity. According to [7,27], people from high-UAI

countries generally have lower tolerance for uncertainty, and feel more threatened by ambiguous situations. On the other hand, high IDV, or individualistic societies, are typically very competitive as well as opportunistic. They are more sensitive to the information that they publish, as it can be used to damage their reputation or careers.

Given the variation in cultural values, we were motivated to investigate the cultural effect on users' behavior in SNS. We concretely investigated two regions: Hong Kong and France, because they have opposite values regarding both UAI and IDV [15]: Hong Kong has low values on UAI (29) and IND (25), whereas France possesses high values UAI (86) and IND (71). Therefore, implied by their cultural differences, we were interested in understanding:

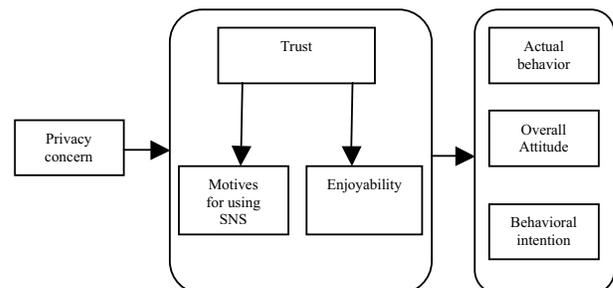


Figure 1. Measured variables and hypothesized relations in our research model.

1) Whether they would have different degrees of privacy concern to SNS. Indeed, users' privacy concern has been recognized very important for social network sites as it determines whether users would be willing to disclose personal info and actively post messages. As suggested above, users from France would have higher privacy concern while using SNS, because they have high UAI and IND values.

2) Whether the differences regarding their privacy concern would be further reflected in users' trust in SNS and their motives for using the site. That is, if a user is very concerned that her/his personal info will be used by the site for other purchases, would s/he unlikely trust the site and hence be not so motivated to provide/share info. Moreover, would their enjoyability degree of using the site be also somewhat affected?

3) Whether user trust and motives, as potentially affected by their privacy concern, would be in turn influential to users' actual uses, overall attitudes, and future behavior intentions on the site. These relationships were theoretically suggested by the Theory of Planned Behavior [2]. It is one of the most predictive persuasion theories, positing that subjective norm (e.g., trust,

privacy, enjoyability) is correlated to the individual behavior, attitude, and behavior intentions (e.g., intention to use the system again). We were hence driven to apply it in SNS area to identify the exact relations among these variables.

Thus, as shown in our research model (see Figure 1), we not only compared the two cultural groups regarding each variable included in the model, but also analyzed these variables' causal paths and the paths' differences between the two groups. The analyses could then tell us whether, when we aim to predict SNS users' actual uses, the privacy concern and the moderating factor "cultural value" should be considered.

To the best of our knowledge, little work has addressed the above questions. In fact, though "privacy" and "trust" issues have been extensively discussed in SNS, the focus has been mainly on proposing some policies or enhancing trust relation between users [1,4,9,11,14], rather than assessing users' privacy concern and trust in SNS from the perspective of their own cultural norms. Moreover, although studies on users' motives and uses of SNS (e.g., Facebook) have been performed [18,21,22], few have experimentally measured the impact of *privacy concern on trust, motives for using SNS*, and furthermore *users' actual behavior and attitude*. Another vacancy of related works is that they did not assess whether people from different nationalities, especially from the two typical cultures (i.e., oriental and western) would behave differently in using SNS.

The following content is hence organized as follows. We first describe how our experiment was setup, including the recruited participants and survey instruments (Section II). We then present the results from surveying users from the two regions: France and Hong Kong (Section III), followed by the analysis of causal relationship among model constructs, respectively in the two groups (Section IV). We then discuss the major findings and explain the reasons (Section V). Finally, we introduce related work (Section VI), and conclude this paper (Section VII).

II. EXPERIMENT PROCEDURE AND MEASURES

We launched an online survey in Jan. 2011 through public messaging boards and popular forums in both Hong Kong and France sides. Till the end of February 2011, 154 persons filled the survey. In order to analyze active SNS users' records ("active" means that the user has used the site for minimal half of a year and used it on average 1 hour per day), we removed 38 unsatisfied users who gave incomplete answers, or ones whose indicated sites are not SNS, or ones who used SNS infrequently. So finally we kept 116 subjects' answers for the analysis: 56 are from France and 60 from Hong Kong.

A. Participants

Table I summarizes these subjects' demographical profiles, their frequency of using SNS, and the number of contacts in their "friends" lists. Among the French users, 24 (42.86%) are males and 32 (57.14%) are females, with the average age 27.43 (ranging from 18 to 46). As for Hong Kong users, the ages fall within the similar range (from 17 to 40), and the average is 22.82. 16 (26.7%) males and 44 (73.3%) females comprise the Hong Kong (HK) samples. The majority of all subjects are students in the university pursuing Bachelor, Master or PhD

degrees, and a few of them work as engineers, teachers, or officers in the domains of business, education, etc. Regarding the site that subjects have used most frequently in the past one year, it is surprising to find that all subjects (including French and Hong Kong users) stated Facebook. It hence shows that Facebook has been actually broadly adopted outside of US and it even defeats the local SNS products in France and HK regions.

Regarding their experiences with SNS, the earliest year of creating SNS account is 2007 and the latest year is 2010 in both groups. The overall visiting frequency is "several times a week" among France, and "once or more than once per day" among Hong Kong users. The average hours that subjects have spent every day are the same between them ("1 to 2 hours"). The subjects also specified the number of contacts in their "friends" list, for which Hong Kong users on average have more friends than French (309.92 vs. 181.93). The difference is significant by t-test ($t = 1.982, p < .001$).

TABLE I. DEMOGRAPHICAL PROFILES OF SUBJECTS FROM TWO REGIONS (THE NUMBER OF USERS IS INDICATED IN THE BRACKET).

	France (56)	Hong Kong (60)
Gender	Male (24); Female (32)	Male (16); Female (44)
Average age	27.43 (st.d. 6.23)	22.82 (st.d. 4.75)
Education background	PhD (12); Master (27); Bachelor (6); High School (8); Other (3)	Master (7); Bachelor (44); High School (8); Other (1)
Profession/Job domains	Students, Professor, Engineer, Teacher, Journalist, etc.	Students, Business, Science, Customer Service, Social Worker, etc
Internet usage	Regularly (daily/almost daily)	Regularly (daily/almost daily)
The SNS that they have used frequently	Facebook	Facebook
When they created the SNS account	2007 to 2010	2007 to 2010
No. of hours spent on SNS every day	1 to 2 hours	1 to 2 hours
Overall visiting frequency to SNS	Several times a week	Once or more than once per day
Number of contacts in SNS	181.93 (st.d. 202.06)	309.92 (st.d. 175.94)

B. Survey Instruments

After getting users' basic info and visiting experiences with SNS, we surveyed their privacy concern, trust, motives for using SNS, enjoyable degree, overall attitude and behavioral intentions. More specifically, the questionnaire is composed of four parts: 1) *questions related to privacy*: the comfortableness that they felt in giving personal profile, the control they felt in specifying/updating the profile, and the privacy protection that they perceived from the site. We also asked their general privacy concern in using Internet, their specific privacy setting in SNS, kinds of personal info that they include in profile, and the messages that they have frequently posted in the site. 2) *questions related to their trust in SNS, major motives for using it and enjoyability degree*; 3) *questions about their overall attitudes towards SNS* (e.g., whether they regard SNS as part of their daily activity and would be sorry if it shuts down) and *behavioral intentions* (e.g., intention to keep using it on a regular basis, and intention to invite friends to use it).

The concrete questions and their corresponding scales are listed from Tables II to VII.

III. RESULTS

In this section, we first analyzed users' answers to each measured variable. For this analysis, we used the Multivariate Analysis of Covariance (MANCOVA) [19], because it can give the adjusted mean values and identify whether the differences (if any) are attributed to nationality, or other factors (e.g., gender).

A. Privacy Concern and Personal Info Disclosure

Though both groups of users averagely agreed that they are concerned about their privacy while using Internet and have configured the privacy setting in SNS high, Hong Kong users rated significantly more positive than French users, as to the three specific privacy questions (Q3 to Q5; see Table II). Concretely, they felt more comfortable in giving personal info on SNS (Q3: $M_{HK} = 2.48$ vs. $M_{French} = 2.03$, $F=6.131$, $p < .1$), perceived higher control in specifying and updating their profiles (Q4: $M_{HK} = 3.80$ vs. $M_{French} = 2.97$, $F=21.142$, $p < .001$), and rated more positive that their privacy is protected by the site (Q5: $M_{HK} = 2.78$ vs. $M_{French} = 2.07$, $F=12.944$, $p < .001$). Since the subjects all use Facebook, the confounding effect by the site's design can be eliminated. The results hence indicate that for the same social network site, HK users generally have less privacy concern than French users.

TABLE II. QUESTIONS ABOUT PRIVACY CONCERN (THE MEANS ARE ADJUSTED MEANS BY MANCOVA)

	Wilks' Λ	F		
Gender	.961	.880		
Nationality	.772	6.434***		
		France (56)	Hong Kong (60)	F
Q1: How often do you concern about your privacy while you use the Internet?		3.79 (st.d=.119)	3.78 (st.d=.115)	.006
Q2: How do you rate the privacy setting of your profile in SNS?		3.67 (.124)	3.40 (.120)	2.404
Privacy factors				
Q3: I feel comfortable giving personal information on SNS (privacy comfortableness)		2.03 (.130)	2.48 (.126)	6.131*
Q4: I felt in control in specifying and updating my profile in SNS (privacy control)		2.97 (.129)	3.80 (.124)	21.142***
Q5: I feel that the privacy of my personal information is protected by SNS (privacy protection)		2.07 (.141)	2.78 (.163)	12.944***

Note 1: All questions were responded on a 5-point Likert scale: Q1 from "very seldom" to "very often"; Q2 from "not private" to "very private"; Q3 – Q5 from "strongly disagree" to "strongly agree".

Note 2: * Significant at $p < .1$; **Significant at $p < .01$; ***Significant at $p < .001$ (the same notations are used in the tables below)

We further used these privacy questions as dependent variables, and nationality and gender as two covariates. The MANCOVA analysis showed that the nationality did take a significant effect on enabling these differences (Wilks' $\Lambda=.77$, $F=6.434$, $p < .001$), but the gender did not (Wilks' $\Lambda=.96$, $F=.88$, $p > .1$).

After knowing how these users perceived their privacy in SNS, we analyzed the types of personal information that they concretely disclosed in their SNS profiles (as they stated). The results revealed several significant differences between the two groups (see Table III). Specifically, HK subjects disclosed significantly more contact info including email (85% vs. 51.8% French users) and instant messenger account (36.7% vs. 17.9% French). However, more French users share marriage status (55.4% vs. 36.2% HK users), real name (83.9% vs. 53.3%) and nationality (73.2% vs. 48.3%). As for other items, like gender, birth date, self-picture, they are all equally sharable in both user groups (above 62%). Some items, e.g. phone number, home address and biography, however, are rarely disclosed by both (below 17%). Subjects also indicated their frequency of updating the profile: HK users stated fairly more active (i.e., "once or several times a week" on average), compared to French subjects who have updated profiles "once or several times a month".

TABLE III. PERSONAL INFORMATION INCLUDED IN USER PROFILE

	France (56)	Hong Kong (60)	F
Real name	83.9%	53.3%	13.746***
Gender	62.5%	75.0%	2.117
Nationality	73.2%	48.3%	7.873**
Birth date	83.9%	86.7%	.171
Email	51.8%	85.0%	16.840***
Phone number	5.4%	0%	3.338
Home address	5.4%	0%	3.338
Location	46.4%	33.3%	2.077
A picture of you	83.9%	86.7%	.171
Marriage status	55.4%	31.7%	6.909*
Messenger	17.9%	36.7%	5.275*
Biography	10.7%	16.7%	.855
Education	42.9%	46.7%	.167

Thus, the above results infer that HK users are more likely to share identifying info (e.g., email and messenger) that others can use to contact them. Given this phenomenon, we further analyzed their answers to "have you ever contacted new people after you met her/him through the SNS?" (see Table IV). Their responses show that HK users actually used other contact ways (that they disclosed in the profiles) to meet new people (e.g., via instant messenger which gets significant difference than French users). More of French subjects, however, stated that they did not communicate with new people outside of the site (60.7% vs. 41.4% HK users, $p < .1$). The finding hence suggests that when users have higher privacy concern (i.e., French subjects), they seem less likely to meet new people and are less likely to disclose the contact info.

TABLE IV. OTHER WAYS THAT USERS HAVE COMMUNCIATED WITH NEW PEOPLE AFTER THEY MET HER/HIM IN SNS

	France (56)	Hong Kong (60)	F
Telephone	5.4%	13.3%	2.150
Face-to-face meeting	17.9%	16.7%	.028
Instant messenger	14.29%	36.7%	7.956**
Email	19.6%	26.7%	.792
Did not communicate	60.7%	41.7%	4.288*

Besides knowing the information disclosed in their profiles, we also asked them what kinds of messages that they have

often posted to the site. Hong Kong users, still, behave more active in posting different types of messages (see Table V). They have published hobbies (46.7% against 21.4% French users), personal life (81.7% vs. 32.1%), interesting observations (53.3% vs. 30.4%), thoughts/opinions (55.0% vs. 35.7%) and forwarded others' posts (31.7% vs. 16.1%). These differences all achieve significant levels.

With the posting percents of subjects to different info items, we classified them at three levels: least sharable (from 0 to 35%), medium sharable (from 35% to 70%), and most sharable (70% to 100%). Though there is intersection among the two groups, more personal content items (e.g., hobbies, personal life, interest observation and thoughts/opinions) appear in HK users' "most sharable" or "medium sharable" groups and French users seem relatively conservative as these items exist in their "least sharable" group.

TABLE V. MESSAGES THAT USERS USUALLY POST TO SNS

	France (56)	Hong Kong (60)	F
News	39.3%	25.0%	2.739
Hobbies	21.4%	46.7%	8.634**
Personal life	32.1%	81.7%	38.206***
Current event	28.6%	31.7%	1.130
Interest observation	30.4%	53.3%	6.511*
Thoughts/opinions	34.7%	55.0%	4.433*
Forward others' posts	16.1%	31.7%	3.911*

B. Trust, Motives for Using SNS, and Enjoyability

At the next step, we were driven to further assess user trust, their actual motives for using SNS and their enjoyability degree. As for the trust question ("my overall trust in SNS is high"), though no significant difference is between them (see Table VI), HK users rated higher than French ($M_{HK} = 2.43$ vs $M_{France} = 2.22$, $F = 1.662$, $p = .200$).

To measure users' motives for using SNS, we used a set of 17 questions which are mainly from existing literatures [18,21,22]. They have been demonstrated with strong content validity, and been in nature to identify users' motives. Indeed, one typical usage of SNS (e.g., Facebook) is to maintain lightweight contact with relationships users had developed offline [17]. Moreover, given the variety of functions available in SNS, the possible motives, according to the theory of uses and gratification [18], can be categorized into five constructs: "keeping relationship", "seeking information", "communicating and sharing information", "seeking entertainment", and "joining groups/events".

Through factor analysis, we classified the 17 questions into the five constructs. Table VI lists the Cronbach's alpha value for each construct and the factor loading values for all items, which actually all exceed the suggested thresholds [25]. It hence validates the reliability of multiple items under a factor.

For those questions, we also deployed MANCOVA analysis to investigate the effects of nationality and gender. Again, the significant effect lies from the nationality (Wilks' $A=.421$, $F=6.868$, $p < .001$), but not from the gender (Wilks' $A=.816$, $F=1.129$, $p = > .1$).

Concretely, both French and HK subjects rated motives "keeping relationship" and "seeking information" important

(i.e., the average rates on most of their items are above 3). For the former, French users regarded it more important than HK users, while the importance scores on items of "seeking information" are higher among HK user (C1: $M_{French} = 3.89$ vs. $M_{HK} = 3.56$, $F = 3.104$, $p < .01$; C2: $M_{French} = 2.99$ vs. $M_{HK} = 3.68$, $F = 25.590$, $p < .001$). Relatively, "communicating and sharing information" is not so important among French (the average rates are mostly below 3), but is still important for HK users (C3: $M_{HK} = 3.32$ vs. $M_{French} = 2.70$, $F= 15.054$, $p < .001$). The other two motive constructs, "seeking entertainment" and "joining groups or events" are rated less important by both, but HK users' rates are still significantly higher than French users' (C4: $M_{HK} = 2.09$ vs. $M_{French} = 1.35$, $F= 32.122$, $p < .001$; C5: $M_{HK} = 2.98$ vs. $M_{French} 2.24$, $F= 19.817$, $p < .001$). The results hence suggest that French users are more motivated to use SNS to keep relationship with people that they know, while for Hong Kong users, they are also motivated to use it to seek and share information. Moreover, HK users are more motivated to use SNS to meet new people (i.e., their rates on the item "I like to use SNS to meet new people" are significantly higher than French users': $M_{HK} = 2.64$ vs. $M_{French} = 1.72$, $F=23.607$, $p < .001$) (see Table VI).

TABLE VI. TRUST, MOTIVES FOR USING SNS, AND ENJOYABILITY.

	Wilks' A		F	
Gender	.816		1.129	
Nationality	.421		6.868***	
	Factor loading	France (56)	Hong Kong (60)	F
Q6: My overall trust in SNS is high.		2.22 (.118)	2.43 (.114)	1.662
C1: Keeping relationship (Cronbach's alpha =.797)				
Reconnecting with people you have lost contact with	.700	3.70 (.145)	3.50 (.140)	1.002
Maintaining relationships with people you may not get to see very often	.681	4.07 (.149)	3.62(.144)	4.796*
C2: Seeking information (Cronbach's alpha =.700)				
Finding out what old friends are doing now	.657	3.42 (.141)	3.76 (.136)	3.081*
Getting to know better about someone that you have just met	.500	2.37 (.147)	3.26 (.142)	18.811***
Viewing photos	.772	3.20 (.141)	4.01 (.136)	16.830***
Viewing friends' updates		3.26 (.155)	3.87 (.150)	7.957**
C3: Communicating and sharing information Cronbach's alpha =.700)				
Chatting with friends	.500	2.71 (.155)	3.30 (.150)	7.438**
Sending offline messages to friends' walls or message boxes	.500	3.08 (.153)	3.01 (.148)	.135
Updating your own status	.773	2.31 (.150)	3.51 (.145)	32.893***
Sharing photos	.715	2.71 (.177)	3.46 (.171)	9.023**
C4: Seeking entertainment (Cronbach's alpha =.827)				
Playing games	.684	1.51 (.142)	2.28 (.137)	15.034***
Discovering new applications, such as	.767	1.40 (.132)	2.36 (.127)	27.486***

<i>ones you saw friends have added</i>				
<i>Taking quizzes, IQ tests, etc</i>	.677	1.32 (.112)	2.07 (.108)	23.136***
<i>Sending virtual gifts</i>	.461	1.17 (.092)	1.66 (.089)	14.825***
C5: Joining groups/events (Cronbach's alpha =.759)				
<i>Organizing or joining events</i>	.705	2.75 (.160)	3.29 (.155)	5.726*
<i>Joining interest groups</i>	.626	2.07 (.142)	2.73 (.138)	10.823**
<i>Communicating with like-minded people</i>	.678	1.88 (.142)	2.91 (.138)	26.396**
C6: I like to use the site to meet new people		1.72 (.136)	2.64 (.131)	23.607***
Enjoyability (Cronbach's alpha =.806)				
<i>Q7: I found my visit to it is often enjoyable</i>	.681	1.72 (.106)	3.26 (.102)	106.746***
<i>Q8: This site provides a channel to help me release my emotional stress</i>	.594	1.97 (.139)	3.45 (.134)	57.955***

Note: All questions were responded on a 5-point Likert scale: Q6 to Q8 & C6, from "strongly disagree" to "strongly agree"; questions in C1 to C5: from "least important" to "very important"; Standard Deviation (st.d.) is in bracket.

Their rates on the items about enjoyability additionally showed that, given their different motives, HK users found their visit to the Facebook more enjoyable ($M_{HK} = 3.26$ vs. $M_{French} = 1.72$, $F = 107.7$, $p < .001$) and they also agreed that the site provides a channel to help them release the emotional stress ($M_{HK} = 3.45$ vs. $M_{French} = 1.97$, $F = 57.96$, $p < .001$).

Combining with the results from users' privacy concern, it implies that French users' higher privacy concerns will likely result in their lower personal profile disclosure and fewer motives for sharing info and joining in activities. As a consequence, they seem not truly benefiting from SNS, so they did not feel it is a very enjoyable and stress-releasing experience. In Section IV, we will reveal the exact causal relations among these factors with standard statistical method.

TABLE VII. OVERALL ATTITUDES AND BEHAVIORAL INTENTIONS.

	Factor loading	France (56)	Hong Kong (60)	F
Overall Attitude (Cronbach's alpha = .851)				
<i>Q9: SNS is part of my everyday activity</i>	.756	3.22 (.153)	3.70 (.148)	5.071*
<i>Q10: I would be sorry if it shut down</i>	.754	2.87 (.163)	3.49 (.158)	7.139**
<i>Q11: I am proud to tell people I am on it</i>	.602	2.48 (.125)	3.07 (.121)	11.145**
Intention to keep using it <i>Q11: I will keep using it on a regular basis in the future</i>		3.38 (.120)	3.90 (.116)	9.552**
Intention to invite friends to use it <i>Q12: I will keep to invite friends to come to this platform</i>		2.74 (.143)	3.44 (.138)	12.219**

Note: All questions were responded on a 5-point Likert scale, from "strongly disagree" to "strongly agree"

C. Overall Attitude and Behavioral Intentions

Overall attitudes and behavioral intentions comprise the final question part. As presented in Table VII, Hong Kong users have significantly more positive attitudes towards SNS ($M_{HK} = 3.42$ vs. $M_{French} = 2.86$, $F = 9.726$, $p < .01$). They not only regard it as part of their daily activity, but also would be sorry if the site shuts down, and are more proud to tell others they are on it. Moreover, for future behavior, they will be more likely to keep using the site ($M_{HK} = 3.90$ vs. $M_{French} = 3.38$, $F = 9.552$, $p < .01$) and continue inviting friends to come to this platform ($M_{HK} = 3.44$ vs. $M_{French} = 2.73$, $F = 12.219$, $p < .01$) than French users. These results imply HK users are more engaged to the SNS platform and tend to incorporate it into their daily life.

IV. CAUSAL RELATIONSHIP ANALYSIS

The two cultural groups' significant differences respecting almost all measured variables drove us to further elaborate the path relationships among these variables. More concretely, as hypothesized in the research model (Figure 1), we intent to reveal, respectively in the two groups, whether privacy factors are correlated to users' trust, motives for using SNS, and enjoyability, and in turn these factors can further predict users' actual uses, overall attitudes and behavioral intentions. For this relationship analysis, we used multiple regression method to analyze the path coefficients and significant levels.

A. From Privacy Concern to Trust and Motives

We first used "trust" as a dependent variable, to be predicted by the three privacy factors (referred to Table II): Q3 - privacy comfortableness, Q4 - privacy control and Q5 - privacy protection. This regression model was found significant in both French and HK groups (French: $R^2 = .524$, $F = 19.059$, $p < .001$; HK: $R^2 = .206$, $F = 4.835$, $p < .01$). Precisely, Q5 was indicated to be a significant causal factor for both French and HK users. Besides, Q3 was also significantly correlated to trust among HK users, though not for French (see Table VIII).

Upon confirming the privacy factors led to trust in SNS, we were interested in knowing the effects of these factors, together with trust, on users' motives for using SNS and their enjoyability degree. The regression models for the seven dependent variables, except for "keeping relationship" in HK group, are all significant (see Table VIII).

Specifically, among French users, Q4 (privacy control) was found as an important factor that significantly influences four motives: "keeping relationship", "seeking info", "communicating and sharing info", and "seeking entertainment". Q3 (privacy comfortableness) is related to "keeping relationship" and enjoyability, and Q5 (privacy protection) is related to "joining groups/events". Trust is also indicated to be significantly related to "communicating and sharing info", "joining groups/events", "meeting new people" and enjoyability.

Among HK users, Q4 (privacy control) is also a crucial factor, which is even significantly influential to all motive constructs and enjoyability. The Q5 (privacy comfortableness),

however, is only correlated to enjoyability in this group, and Q6 (privacy protection) is not related to any variables. User trust, on the other hand, is significantly associated with enjoyability, but not with other constructs.

The above results therefore show that for the two groups, the factors that affect their trust, motives, and enjoyability are highly different. For French, the three privacy factors seem all taking effect, whereas for HK users, only the user-control in specifying and updating profiles takes the dominant role in influencing their motives for using the site. The other two privacy factors, however, are not so directly related to the usage motivations, though “privacy comfortableness” and trust are related to the enjoyability degree. It hence suggests that higher privacy concerns from French users can significantly impact their motives and ways of using the site. Relatively, as HK users have lower concern, they only care about whether they could have control in providing the personal info, which will primarily affect their motives.

TABLE VIII. FROM PRIVACY CONCERN TO TRUST, MOTIVES AND ENJOYABILITY

	France		Hong Kong	
	β	<i>t</i>	β	<i>t</i>
Trust	$R^2=.524; F=19.059^{***}$		$R^2=.206; F=4.835^{**}$	
Q3: Privacy comfortableness	.157	1.462	.239	1.937*
Q5: Privacy protection	.646	6.184 ^{***}	.316	2.574*
Keeping relationship	$R^2=.259; F=4.462^{**}$		$R^2=.125; F=1.959$	
Q3: Privacy comfortableness	.248	1.796*	.156	1.155
Q4: Privacy control	.322	2.473*	.278	2.157*
Seeking information	$R^2=.141; F=2.086^*$		$R^2=.238; F=4.298^{**}$	
Q4: Privacy control	.263	1.879*	.426	3.543 ^{***}
Communicating and sharing information	$R^2=.364; F=7.292^{***}$		$R^2=.356; F=7.611^{***}$	
Q4: Privacy control	.254	2.102*	.494	4.469 ^{***}
Q6: Trust	.515	3.181 ^{**}	.167	1.375
Seeking entertainment	$R^2=.142; F=2.114^*$		$R^2=.197; F=3.380^*$	
Q4: Privacy control	.296	2.114*	.264	2.141*
Joining groups/events	$R^2=.178; F=2.765^*$		$R^2=.225; F=3.992^{**}$	
Q4: Privacy control	.178	1.298	.391	3.225 ^{**}
Q5: Privacy protection	-.307	1.681*	.019	.149
Q6: Trust	.514	2.793 ^{**}	.106	.793
Meeting new people	$R^2=.215; F=3.493^*$		$R^2=.190; F=3.225^*$	
Q4: Privacy control	.042	.311	.345	2.784 ^{**}
Q6: Trust	.404	2.244*	.228	1.675
Enjoyability	$R^2=.236; F=3.949^{**}$		$R^2=.321; F=6.511^{***}$	
Q3: Privacy comfortableness	.255	1.824*	.226	1.902*
Q4: Privacy control	.074	.556	.341	3.008 ^{**}
Q6: Trust	.343	1.934*	.297	2.386*

Note: Q3 to Q5 are referred to Table II, Q6 referred to Table VI; due to space limit, the non-significant results are not listed in the table.

B. From Trust and Motives to Actual Uses, Attitudes and Behavioral Intentions

Finally, we measured the effects from trust, motives and enjoyability to users’ actual uses, overall attitudes and future behavior. Specifically, the actual uses include users’ overall visiting frequency and amount of contacts in their “friends” list, and the behavioral intentions include intention to keep using it, and intention to invite friends to use it (as we discussed in Section III.C).

In this analysis, the aforementioned trust degree, motives and enjoyability while using SNS were taken as independents variables in the multiple regression models. As shown in Table IX, the models are significant for all dependent variables, with one exception to the visiting frequency in HK group.

Specifically, looking into the influential factors for each variable, we found that among French users, the motive “communicating and sharing information” significantly affects their visiting frequency, overall attitude, and “keep using it” intention, while motive “joining groups/events” affects their amount of contacts, and motive “seeking entertainment” affects whether they will invite physical friends to this platform.

In comparison, the influential factors exhibit different among HK users. For them, “trust” influences the amount of contacts, motives “seeking information” and “meeting new people” impact overall attitudes, enjoyability is associated with the intention to keep using it, and “keeping relationship” and “meeting new people” influence their behavioral intention of inviting others to use the same site.

TABLE IX. FROM TRUST, MOTIVES AND ENJOYABILITY TO ACTUAL USES, OVERALL ATTITUDES AND BEHAVIOR INTENTIONS

	France		Hong Kong	
	β	<i>t</i>	β	<i>t</i>
Visiting frequency	$R^2=.592; F=8.527^{***}$		$R^2=.219; F=1.784$	
C3: Communicating and sharing information	.380	2.297*	.125	.876
Amount of contacts	$R^2=.241; F=1.864^*$		$R^2=.247; F=2.095^*$	
Trust	.009	.053	.279	2.060*
C5: Joining groups/events	.421	2.370*	.188	1.211
Overall attitudes	$R^2=.547; F=7.098^{***}$		$R^2=.586; F=9.012^{***}$	
C2: Seeking information	.077	.539	.293	1.992*
C3: Communicating and sharing information	.437	2.509*	.123	.716
C6: Meeting new people	-.028	-.165	.276	2.826 ^{**}
Intention to keep using it	$R^2=.435; F=4.524^{***}$		$R^2=.312; F=2.892^*$	
Enjoyability	-.068	-.335	.479	2.752 ^{**}
C3: Communicating and sharing information	.584	3.003 ^{**}	-.116	-.520
Intention to invite friends to use it	$R^2=.326; F=2.847^*$		$R^2=.369; F=4.185^{**}$	
C1: Keeping relationship	.066	.414	.236	1.704*
C4: Seeking entertainment	.373	2.741 ^{**}	.142	1.137
C6: Meeting new people	-.241	-1.166	.319	2.707 ^{**}

Note: C1 to C6 are referred to Table VI; due to space limit, the non-significant results are not listed in the table.

Among these leading factors, it can be seen that for French users, the motive “communicating and sharing info” will not only likely influence their visiting frequency, but also overall attitudes and usage intention. Combining with prior results that this motive is affected by privacy factors and users’ scores on the privacy factors and this motive are nearly negative for Facebook, it can explain why their actual uses and attitudes with the site are not so high in comparison with HK users. As for HK users, not only the leading factors are different, but also users’ higher appraisals on these factors and these factors-related privacy constructs can indicate why they behave more active in using the same social network site.

V. DISCUSSIONS

From this user survey, we find that French and Hong Kong users did possess significantly different degrees of privacy concern while using SNS. Specifically, French users felt less comfortable in giving personal information, less control in specifying and updating their profiles, and perceived the site less competent in protecting their privacy. It seems as a natural consequence that they less disclosed identifying info in their profiles. In comparison, HK users are more active to share contact info (e.g., email and instant messenger). They are also more active in contacting new people after they met her/him in SNS through these ways. In addition, French users tend to publish general content such as news and events, while more of HK users frequently post personal content items (e.g. hobbies, personal life, thoughts/opinions, etc).

The further analysis showed that they also have different motives for using SNS. French users regard the use “keeping relationships” more important than HK users, whereas HK users are more motivated to use the site for seeking/sharing info and meeting new people. Moreover, HK users often found their visit to the site enjoyable, and have taken the site as part of their daily activity. They also indicated that they will keep using it at a regular basis and even continue inviting friends to come to this platform. In comparison, French users gave lower rates on these variables.

The multivariate analysis of covariance verifies that these differences can be attributed to the nationality, rather than others (e.g., gender).

To correlate users’ privacy concerns to their trust, motives and enjoyability, and furthermore correlate the latter factors to users’ actual uses, overall attitudes and behavioral intentions, we did the multiple regression analyses. The results show that the causal factors are different among the two cultural groups. For French users, the three privacy factors all take effect on one or more motives, whereas for HK users, only the user-control in specifying and updating profiles takes the dominant role in influencing users’ motives. Moreover, though it reveals that the motive “communicating and sharing info” influences French users’ visiting frequency, overall attitude and usage intention, but since it is affected by privacy factors, we can conclude that the higher privacy concerns did impact French users’ ways of using SNS. Indeed, they reacted quite conservative relative to HK users: lower personal info disclosure, less willingness to meet new people, fewer motives for sharing info and joining in activities, and less contacts in

their “friends” list. HK users, on the other hand, behave more active regarding these aspects, and their activeness can be likely caused by their lower privacy concerns.

The questions we initiated before conducting the survey were hence well answered. To explain these differences, we believe that the theory of Hofstede’s cultural dimensions can be referential [15]. As it suggests, the group with low IND (individualism) and UAI (uncertainty avoidance) values, such as Hong Kong users, emphasizes family integrity, in-group membership, strong solidarity, and interdependence among people. With low IND scale, they are likely to have higher degree of loyalty to other people and institutions, and also tend to suppress their emotions and behaviors. Therefore, they should be in nature more willing to establish close social connections with others and disclose more about themselves. On the contrary, the group with high IND and UAI indices, such as French, is characterized by self-reliance, and emotional distance from in-groups. They are risk-averse, feel threatened by uncertain conditions, and prefer the tried and tested ways over new methods [7]. This may be why they care more about their own privacy and attempt to keep distance from others (especially from new people).

VI. RELATED WORK

The cultural dissimilarities have been studied in the area of e-commerce sites. For example, Cry et al. examined the survey data from users in Canada, U.S., Germany and Japan, and showed that trust, satisfaction, loyalty and design preferences are different across cultures [4]. Moreover, the internet shopping rates are also influenced by cultural values. Lim et al. suggested that people from individualistic culture are more likely to have Internet shopping [23]. However, few researchers have attempted to identify the cultural differences in using SNS. Only till very lately, Kim et al. studied the usage of SNS by American and Korean students, and found that the former has more positive attitude toward SNSs when they seek new friends, and the latter has favorable attitude toward SNS in seeking social support. Vasalou et al. analyzed the effect of culture on true commitment in Facebook [28]. They examined users from five countries and identified several cross-cultural differences. For example, users from Italy rated groups, games and applications more important than US users, whereas US users rated status updating and photographs more important.

However, little work has investigated users’ privacy concern in SNS as potentially impacted by their cultural values, and furthermore the impact of privacy concern on users’ motives and actual uses. The work that is most related to ours is from Dwyer et al. [8]. They investigated the influence of privacy and trust on social interactions and willingness to share information in two social network sites, Facebook and MySpace, and concluded that online relationships can develop in sites where perceived trust and privacy safeguards are weak. Acquisti et al. found that the privacy concerns of a SNS can influence users to join the network and the amount of personal information they disclosed [1]. They stated that those who are aware of the visibility of their profiles rely on their own ability to control

the information that they disseminate. Krasnova et al. used the “privacy calculus” to investigate the cultural divergence aspects in SNS [20]. They indicated that users from Germany and USA share similar importance on the enjoyment construct, but are not identical regarding control and legal assurance constructs.

Nevertheless, the differences between the two typical cultural contexts, oriental and western cultures, were still not clear. The merit of our paper is thus that we not only identified the causal relations among privacy concern, trust, motives and users’ actual uses and future intentions, but also studied the cultural effect by recruiting users from the two representative regions.

VII. CONCLUSION

In conclusion, though the subjects’ scale is limited in this survey, it revealed significant differences between French and Hong Kong SNS users from various aspects. More notably, the privacy factors that respectively affect the two groups of users’ trust, motives, and furthermore actual uses and attitudes were revealed from the survey. Thus, under the influence of different cultural values, it can be seen that privacy concern, motives as well as usage behaviors on the same SNS platform (i.e., Facebook) are not identical. The higher privacy concerns as indicated by French users did impact their ways of disclosing personal info and using the site.

For our future work, we will conduct more experiments to consolidate these relations. We will recruit more users, not only from Hong Kong and France, but also from other eastern and western countries, to further test the roles of various cultural values in influencing SNS users. We believe that our observations will be suggestive to SNS practitioners, especially to those who aim at growing their business to a global scale. They can be guided to better adapt SNS services to fulfilling the expectations of users with different cultural norms.

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