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ACCEPTANCE OF SOCIAL NETWORK WEB SITES: THE EFFECTS OF SOCIAL INFLUENCE

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Abstract

This study has proposed and empirically tested a social network (SN) Web site acceptance model that incorporates social influence, social motives and technology acceptance factors. The three processes of social influence: compliance, identification and internalization are used to explain the causal antecedents of social motives, technology acceptance factors and intention. An online survey generates 274 usable responses. The results indicate that social influence has positive effects on intention, social motives, and perceived usefulness and enjoyment through compliance, identification and internalization respectively. The two social motives: sociability and status play a significant role in the proposed model.

Introduction

With the proliferation of Web 2.0 technologies, there has been a remarkable growth of the number of people participating in online social networks. These SN Web sites (e.g. Facebook) provide to users a suite of valuable features at no price. A recent survey [32] indicates that the percentage of adult Internet users who have an account with one of these SN Web sites has grown from 8% in 2005 to 46% in 2009. Since these users are also potential online customers, some organizations have placed advertisements through selected SN Web sites. Given the massive number of users and the potential implications in electronic commerce, understanding the determinants of the acceptance of these Web sites is valuable.

Technology acceptance has been studied extensively in the past three decades [13][22][36] [49][50]. According to previous research findings, social influence has mixed and inconclusive effect on technology acceptance in both workplace settings [9][13][22][28][36] and non-work settings [24][26]. Such mixed and inconclusive effect could be due to the differences in the nature of the target behavior and the operationalization of the social influence construct among the studies. Further research is needed to investigate the impact of social influence on technology acceptance in different usage contexts.

The fundamental argument of this study is that the social influence affecting technology acceptance in non-work settings is somewhat different from those affecting the decision in the workplace due in part to the referent exerting the influence. While supervisors are usually the most importance referent for productive use of technology at work, friends and peers are usually the most important referents for hedonic use of technology after work. Although prior study [48] has examined the three processes: compliance, identification and internalization, of social influence on technology acceptance in the workplace, there is no such study in non-work settings. This paper represents one of the first studies to investigate this. Additionally, although social psychology literature has suggested that people have two broad social motives: connecting to others, and status or power seeking, when they develop a relationship with others [25][35], these two social motives have not previously been operationalized or empirically tested together in information systems (IS) research.

This study addresses the above gaps in the technology acceptance literature by examining the social influence process and the roles of the two social motives: sociability and status, in the acceptance of SN Web sites. Building upon studies of social psychology and technology acceptance, a theoretical model as shown in Figure 1 is proposed and empirically tested.

Theoretical background and hypotheses

Technology acceptance factors

Several theoretical models have been proposed and tested in the past for understanding an individual's acceptance of information technology (IT): the theory of reasoned action (TRA) [1], the theory of planned behavior (TPB) [2], the technology acceptance model (TAM) [13][14] and the innovation diffusion theory (IDT) [40]. Among these models, TAM is the most widely adopted model [9][27][31][50]. Davis et al. [14] has adapted TRA as a theoretical basis in proposing the TAM, which is specifically tailored for modeling user acceptance of IT in a work setting. It uses two beliefs: perceived usefulness (PU) and perceived ease of use (PEU), in predicting IT acceptance. PU is defined as the degree to which a person believes that using a particular IT would

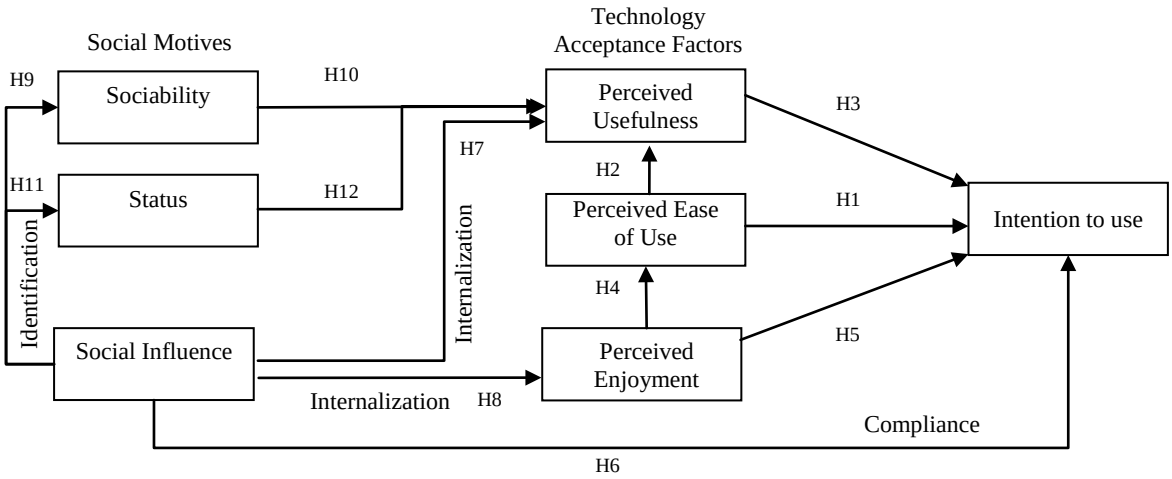

Figure 1. Research Model

enhance his or her job performance. PEU is defined as the extent to which a person believes that using a particular IT would be free of effort. Previous TAM related studies [45] have confirmed that PU and PEU have positive effects on one's intention to use IT, and PEU has a positive effect on PU. We expect an individual's intention to use a SN Web site is also determined by his or her perception of its usefulness and ease of use. Thus, the following hypotheses are proposed.

H1: PEU will have a positive effect on one's intention toward using a SN Web site.
H2: PEU will have a positive effect on the PU of a SN Web site.
H3: PU will have a positive effect on one's intention toward using a SN Web site.

Perceived enjoyment (PEJ) is added to the proposed research model because the Web site usage is in part for pleasure and fun. PEJ is defined as "the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" and it has a direct impact on one's intention to use IT [15]. In the present context, people will tend to use the SN Web sites if they find them enjoyable. In addition, previous study [24] has found that PEJ has a positive effect on PEU. We expect that people will find the SN Web sites more easy to use when they have fun in using them. Thus, the following hypotheses are proposed.

H4: PEJ will have a positive effect on the PEU of a SN Web site.
H5: PEJ will have a positive effect on one's intention toward using a SN Web site.

Social influence

Social influence is represented by subjective norms in TRA and TPB, and social factors in the Model of PC Utilization [46]. Social influence is also incorporated in the Unified Theory of Acceptance and Use of Technology [50] and the IDT [37][40]. While social influence has different labels in different models, each of these constructs contains the explicit or implicit meaning that people's behavior is affected by their beliefs on how others will view them when they use the technology.

In technology acceptance research, some studies have found a positive effect of social influence on one's intention to adopt an IT [22][28], while other studies have found no such effect [9][14][36][42]. Some studies have also found a stronger effect of social influence on IT acceptance behavior for novice users than for experienced users [44], women than for men [49], and mandatory setting than for voluntary setting [22]. Furthermore, some studies have examined the indirect effect of social influence on intention through perceived usefulness and again, the results are mixed. For instance, one study [34] has not found a positive effect while another study [48] has found such effect. Thus, more research is necessary to examine the impact of social influence on technology acceptance. Since the SN Web sites are mostly used by someone to connect to their peers, the influence from peers should have an effect on one's acceptance of the technology. Drawing upon Kelman's [29][30] social influence theory, social influence is posited to operate through three processes: compliance, identification and internalization.

Compliance effect of social influence

The compliance effect causes people to accept influence because they hope to achieve a favorable reaction from important others [29][30]. This compliance effect implies social influence will affect one's intention to use IT [9]. Thus, the following hypothesis is proposed:

H6: Social influence will have a positive effect on one's intention to use a SN Web site.

Internalization effect of social influence

The internalization effect occurs when people accept influence because the content of the induced behavior is perceived as being inherently instrumental to the attainment of their goals or purposes [29][30]. In our context, people may accept the opinion of peers to use SN Web sites because the Web sites can help them to achieve their utilitarian and hedonic purposes. This internalization effect is equivalent to informational social influence [17], which occurs when individuals accept information from others as trustworthy evidence of reality and alter their behavior based on this information. Such effect is also suggested by prior research on communication technologies [20]. Drawing upon the social information processing theory [41], Fulk [20] suggests that people's belief about a technology can be influenced by those in their social networks. The utilitarian and hedonic purposes for one to use the SN Web sites are captured by the constructs of PU and PEJ respectively in our research model. Previous studies have verified that social influence has a positive effect on the PU [49] and PEJ [10][18] of IT. Thus, the following hypotheses are proposed:

H7: Social influence will have a positive effect on the PU of a SN Web site.

H8: Social influence will have a positive effect on the PEJ of a SN Web site.

Identification effect of social influence

The identification effect occurs when people accept influence because they want to establish or maintain a satisfying self-defining relationship to another person or group [29][30]. Social psychology literature has suggested that people have two broad social motives: connecting to others, and status or power seeking, when they develop a relationship with others [25][35]. Empirical studies in psychology have found that the need to form and maintain strong, interpersonal relationships is a powerful, fundamental and extremely pervasive motive [6], and the need to attain social status in the group to which we belong is important to our social life [4]. This study proposes two social motives: sociability and status motives that could be influenced by the opinions of peers through the identification effect.

Sociability

Sociability motive is defined as an individual characteristic that reflects his or her desire to affiliate with others. Previous studies have demonstrated the importance of sociability motive in the use of communication technologies [33][39]. We expect social influence will have a positive effect on people's sociability motive through the identification effect because people want to establish or maintain satisfying relationships with their peers. Furthermore, people form perceived usefulness judgment in part by comparing what an IT is capable of doing with their important goals [48]. We expect users of SN Web sites will also assess how well the Web sites can help them to satisfy their sociability motives before forming the perception of usefulness. Thus, the following hypotheses are proposed:

H9: Social influence will have a positive effect on one's sociability motive.

H10: Sociability motive will have a positive effect on the PU of a SN Web site.

Status

Status motive is defined as the degree to which sharing information online is perceived to enhance status in one's social system. Social exchange theory [7] suggests that people have certain social rewards expectation when they engage in social interaction. One of the social rewards is status enhancement. Previous study [51] has suggested that professional people's reputation will be enhanced through sharing knowledge in an online community. Hence, this study suggests people's social status will be enhanced if they share information (e.g. feelings, knowledge, opinions) with their peers. This status motive will be strengthened by social influence because people want to establish or maintain satisfying relationships with others through the identification effect. Moreover, when people decide whether the SN Web sites are useful or not, they will assess how well the Web sites can help them to satisfy their status motives. Previous IT acceptance study in workplace settings [48] has confirmed that social influence has a positive effect on one's image or status, which in turn has a positive effect on PU. Thus, the following hypotheses are proposed:

H11: Social influence will have a positive effect on one's status motive.

H12: Status motive will have a positive effect on the PU of a SN Web site.

Research methodology

Data collection

Data were collected by conducting an online field survey of SN Web site users. Since a complete

directory of SN Web sites does not exist, it is impossible to select a random sample of users. Previous similar studies conducted online surveys through convenient samples [26][42]. To collect the data, we searched for the respondents by the names of local high schools and universities in Hong Kong. This method was chosen because SN Web site users would normally input the names of their high schools or universities. We believe Hong Kong is a suitable place to conduct the study because of its massive number and diversity of SN Web site users. In the process of selecting respondents, we strived to select a representative sample that had a proper mix of gender, age and education. We also tried to select the respondents not just from Hong Kong but also from mainland China. Invitation messages, which contained the URL of the online questionnaire, were sent to the selected respondents through the messaging function or online message boards of the SN Web sites. Examples of these Web sites included Facebook, Renren, Xanga and Yahoo!Blog. They were chosen because these Web sites are popular among Chinese users.

Subjects were asked to recall their experience with a SN Web site that they used most often in the last three months. The three-month period was chosen to ensure the respondents had a clear reminiscence of their experience with the Web Site. In order to increase the response rate, incentives of cinema coupons were offered as lucky draw prizes. Within a one month period, 279 people completed the online questionnaire. Responses with duplicate IP addresses and emails addresses were eliminated. At the end, there were 274 usable responses for further analysis.

Measures

The measurement items used to operationalize the constructs were derived with reference to prior studies and the wordings of the items were adjusted to match the present context. New items were added if necessary. The measurement items of PU and PEU were modified from Davis [13] and Debrand et al. [16]. The measurement items of PEJ were adapted from Davis et al. [15]. The measurement items of intention were modified from Heijden [23]. Following Ajzen [3], social influence was measured by examining the normative beliefs of the referent groups: friends, classmates and people in one's social group. The measurement items of the sociability construct was modified from O'Keefe et al. [39]. The measurement items of the status construct was modified from Moore et al. [37] to reflect the difference that the target behavior is sharing information online after work rather than using an innovation at work . All items used seven-point Likert scales, anchored from 1: "strongly agree" to 7: "strongly disagree". The items were originally in English and were translated into Chinese by a bilingual academic. To obtain a good level of translation, a back-translation [8] was conducted. The Chinese and English versions of the questionnaire were reviewed by three other bilingual academics to ensure that both versions were comparable at a high degree of accuracy. The items are listed in Appendix A.

Before conducting the main survey, we performed a pre-test and a pilot study to validate the instrument. The pre-test was conducted using a sample of 10 students of a local university, who were also experienced users of SN Web sites. Based on their feedbacks, possible misunderstandings of those items were clarified and some items were deleted or modified at the end. A pilot study using a sample of 350 students was then conducted to test the measurement instrument before the main study was administered.

Data analysis and results

PLS-Graph version 3.0 (PLS) [11] that employs the partial least squares technique was used to test the research model. The partial least squares technique has been gaining interest as it places less stringent demands on measurement scale, sample size and distributional assumptions [12].

Analysis of respondents

The demographic profile of the respondents is shown in Table 1. 9% of the age information was missing, and we estimated them based on the age distribution of the collected data [47]. Forty-two percent of the respondents are male and fifty-eight percent are female. Fifty-three percent age from 19 to 24 years old and sixty-nine percent of the respondents have used Facebook the most often in the last three months.

Instrument validity

Convergent validity and discriminant validity of the measurement instrument were assessed. Convergent validity was assessed by examining the reliability of items, composite reliability and Cronbach's alpha, average variance extracted and the confirmatory factor analysis (CFA) results [21]. The discriminate validity was assessed by examining the CFA results and the relationships between the square roots of the AVEs and the correlations among constructs [21]. In the initial test of validity, two PEJ items and one sociability item were found to either have a loading below the threshold level of 0.70 [5] or correlate more highly with other items rather than with the items in their underlying constructs. Final data analysis was conducted after dropping these three items.

Table 1: Respondents' characteristics

Measure	Items	Frequency	Percent
Gender	Male	114	42
	Female	160	58
Age	12-18 year old	20	7
	19-24 years old	144	53
	25-30 years old	75	27
	> 30 years old	35	13
Education	High School	24	9
	Degree / Diploma	190	69
	Post-graduate	60	22
SN Web site used most often	Facebook	189	69
	Renren	44	16
	Xanga	15	6
	Others	26	9
Experience in using the SN Web site	< 1 year	26	9
	1 year	55	20
	2 years	95	35
	>2 years	98	36
Average usage time in one visit	< 1 hr	76	28
	1 hr	89	32
	2 hrs	51	19
	>2 hrs	58	21
Days of using the Web site per week	1 -5 days	67	24
	6 days	46	17
	7 days	161	59

Table 2: Item loadings and factor analysis results

Items	Loadings	Factor Analysis Results						
		ST	PU	SI	PEU	PEJ	INT	SC
ST1	0.828	0.828	0.435	0.329	0.176	0.266	0.233	0.330
ST2	0.881	0.880	0.430	0.357	0.219	0.316	0.252	0.321
ST3	0.880	0.880	0.452	0.431	0.370	0.422	0.332	0.338
ST4	0.913	0.913	0.443	0.450	0.367	0.405	0.301	0.312
PU1	0.832	0.430	0.832	0.503	0.383	0.341	0.375	0.550
PU2	0.856	0.443	0.856	0.537	0.374	0.378	0.429	0.522
PU3	0.895	0.441	0.895	0.576	0.362	0.445	0.532	0.541
PU4	0.906	0.442	0.906	0.575	0.400	0.427	0.556	0.546
SI1	0.934	0.408	0.585	0.934	0.430	0.350	0.543	0.436
SI2	0.944	0.411	0.608	0.944	0.398	0.357	0.522	0.495
SI3	0.902	0.433	0.556	0.903	0.384	0.369	0.518	0.465
PEU1	0.901	0.256	0.341	0.303	0.902	0.194	0.372	0.203
PEU2	0.899	0.274	0.350	0.355	0.899	0.224	0.393	0.257
PEU3	0.897	0.343	0.460	0.488	0.897	0.296	0.461	0.257
PEJ1	0.945	0.341	0.455	0.382	0.263	0.945	0.427	0.350
PEJ2	0.932	0.425	0.402	0.343	0.243	0.932	0.390	0.324
INT1	0.905	0.299	0.474	0.547	0.410	0.401	0.905	0.343
INT2	0.898	0.280	0.513	0.479	0.418	0.384	0.898	0.382
SC1	0.896	0.370	0.574	0.473	0.240	0.364	0.385	0.896
SC2	0.863	0.277	0.510	0.407	0.231	0.263	0.319	0.863

Note: All loadings are significant at the 0.01 level.
ST: status, PU: perceived usefulness, SI: social influence, PEU: perceived ease of use, PEJ: perceived enjoyment, INT: intention, SC: sociability

In the test of convergent validity, all items shown in Table 2 have loadings exceeding the 0.70 threshold level, which indicate they are reliable. Table 3 shows the composite reliabilities of the constructs range from 0.87 to 0.95, which are all above the suggested minimum benchmark 0.7 for acceptable reliability [5]. Similarly, the Cronbach's alpha values range from 0.71 to 0.92, which exceed the minimum threshold 0.6 for acceptable reliability [38]. Table 3 shows the AVEs of each construct are all above the minimum threshold 0.5, with the lowest being 0.76, which indicate convergent validity of the constructs [12]. In addition, Table 2 shows all loadings exceed the threshold 0.71 to be considered as excellent convergent validity [43].

The factor analysis results in Table 2 show the loadings of the items on their corresponding constructs are much higher than their loadings on the other constructs, which indicates satisfactory discriminant validity. High discriminant validity also occurs if the square root of a particular construct's AVE is greater than the construct's correlations with the other constructs [12][19]. Table 3 shows that the correlation between any pair of constructs is much lower than the square roots of AVEs for the pair of constructs, which indicates satisfactory discriminant validity.

Table 3: Means (standard deviations), Cronbach alpha, composite reliability, average variance extracted and their square roots, and correlations among constructs

Construct	M (SD)	CBA	CR	AVE	ST	PU	SI	PEU	PEJ	INT	SC
ST	3.2 (1.7)	0.90	0.93	0.77	**0.88**						
PU	2.4 (1.0)	0.89	0.93	0.76	0.50	**0.87**					
SI	2.4 (1.4)	0.92	0.95	0.86	0.45	0.63	**0.93**				
PEU	2.1 (1.2)	0.88	0.93	0.81	0.33	0.44	0.44	**0.90**			
PEJ	2.5 (1.0)	0.86	0.94	0.88	0.41	0.46	0.39	0.27	**0.94**		
INT	1.9 (0.9)	0.77	0.90	0.81	0.32	0.55	0.57	0.46	0.44	**0.90**	
SC	1.9 (0.7)	0.71	0.87	0.77	0.37	0.62	0.50	0.27	0.36	0.40	**0.88**

M(SD): Mean (standard deviations), CBA: Cronbach alpha, CR: composite reliability,
AVE: average variance extracted, square root of the AVE are the bolded diagonal values.

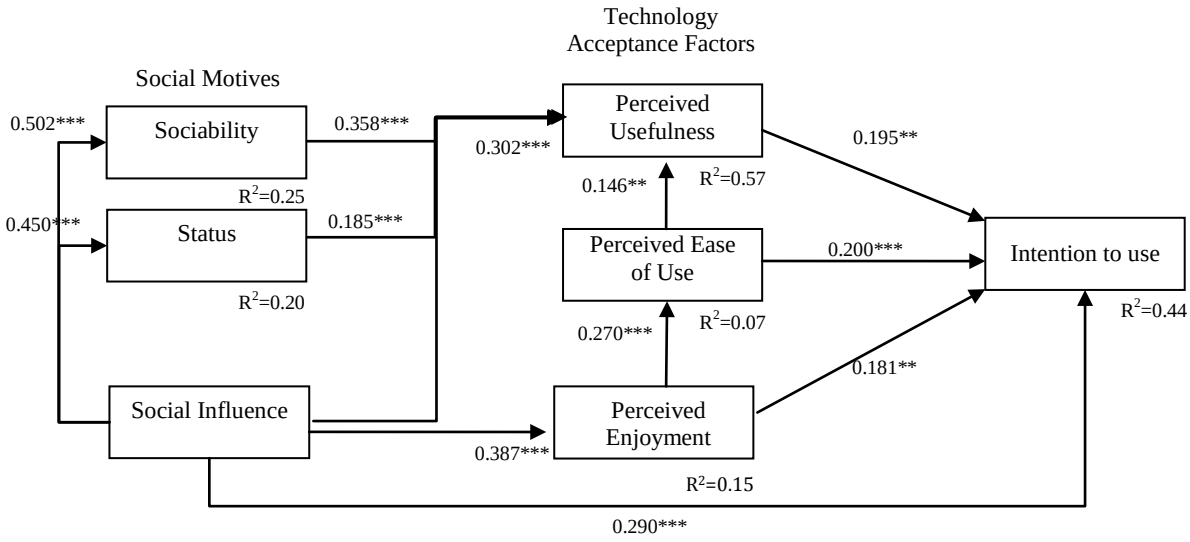

Figure 2. PLS results

** *significant at the 0.01 level*
*** *significant at the 0.001 level*

Model testing results

The PLS results of path coefficients, path significance, and variance explained (R^2) for each dependent variable are as shown in Figure 2. All the hypotheses are supported and the hypothesized paths are significant at the 0.01 level or above. The model does a good job of explaining variance in one's intention to use (44%) and in the PU (57%) of the Web sites.

Discussion

Implications for research

There are couple theoretical contributions from the current study. First, this is one of the first studies that examined all the three effects: compliance, internalization and identification, of social influence on technology acceptance in non-work settings. Our results show that the compliance effect of social influence on one's intention is the strongest when compared to those effects exerted by the three technology acceptance factors. It implies that the effect of social influence should not be ignored. In addition, this study supports findings of previous studies in workplace settings [48] that influence from others has a positive effect on the PU of IT through the internalization effect. Another internalization effect of social influence that we have found is on the PEJ. Although prior studies [10][18] have found similar effect, they have not clearly addressed the theoretical base to support the argument. Furthermore, we have also found that social influence has a significant identification effect on people's sociability and status motives.

Second, our results demonstrate that both sociability and status motives play a key role in determining the usefulness of the SN Web sites, which ultimately affect the acceptance of those Web sites. Users of SN Web sites are motivated by the need to stay in touch with their peers and to improve social status among their peers. When the SN Web site is capable of meeting their sociability and status motives, they would find the Web site useful. The significant role of the sociability and status motives in our model indirectly confirms the suggestions of previous social psychology studies [25][35] that people have the sociability and status motives in mind when they develop a relationship with others.

Implications for practice

Our results suggest that SN Web site hosting companies should strive to provide features that are useful and easy to use. For the features to be perceived as useful, they should satisfy users' two social motives: sociability and status motives. For satisfying the sociability motive, the SN Web sites could allow users to send greeting cards to others and to search people by living districts. For satisfying the status motive, the SN Web sites could strengthen the information sharing capability of their Web sites. For instance, they could consider ranking the users by the amount of materials that they share with others. Users who share more information with others will be given recognition by the Web sites, such as giving a VIP status, and such measure may improve their social status among others.

Our results also suggest PEJ is important in affecting people's decision to use the SN Web sites. One key factor that brings enjoyment to users is the Web site content. The SN Web sites could improve the publishing tools for users to organize different contents on their homepage. Last but not least, our findings indicate that social influence is very important for one to use SN Web sites. Therefore, SN Web sites could consider giving out incentives to existing users to invite their friends to join the Web sites.

Limitations

In interpreting the results, one must consider a number of limitations. First, the sample is self-selected and therefore a bias existed. Second, we did not differentiate respondents' behavioral orientation since some of them might use the Web sites for searching information rather than sharing information with others. Third, the subjects are Chinese and social influence may operate differently in other cultures. Hence, caution needs to be taken when generalizing the results to other user groups with different cultures. Fourth, we did not include non adopters in our sample. Fifth, given the survey measures were collected at the same point in time, causality can only be inferred. Sixth, the explained variance of one's intention to use SN Web site is only 44%. Although this amount of explained variance is comparable to other TAM extension studies, we suggest further refinement of the model, by including other important variables that affect one's intention to use SN Web sites.

Future research

This study examines the social influence process for adopters of SN Web sites only. Further research can examine the social influence process for non adopters as they may be driven by different factors. Future research could also use respondents from different cultures in order to improve the generalization of the results. One could also distinguish the social influence process for two different online behaviors: searching and reading other's postings versus sharing information with others through the Web sites. Other factors

such as group affiliation could be added to the model to improve the explanatory power.

Acknowledgements

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Appendix A: Items

Item	Description
SC1	I can stay in touch with others using the Web site.
SC2	I can find out what is going on with others using the Web site.
SC3	I can maintain friendship with others using the Web site.*
	Sharing things (e.g. feelings, knowledge, opinions) with others through the Web site
ST1	improves my image among them.
ST2	improves my status among them.
ST3	makes me becoming a more valued member of my social group. (new)
ST4	increases my popularity among them. (new)
PEJ1	I have fun using the Web site.
PEJ2	Using the Web site provides me with a lot of enjoyment.
PEJ3	I enjoy using the Web site.*
PEJ4	It is boring for me to use the Web site.* (reverse coded)
PEU1	Learning to operate the Web site is easy for me.
PEU2	It is easy for me to become skillful at using the Web site.
PEU3	I find the Web site easy to use.
PU1	The Web site enables me to accomplish my purpose of online social contact more quickly.
PU2	The Web site enables me to fulfill my purpose of online social contact more effectively.
PU3	The Web site makes it easier for me to satisfy my purpose of online social contact.
PU4	The Web site is useful in meeting my purpose of online social contact.
SI1	My friends think that I should use the Web site.
SI2	My classmates think that I should use the Web site.
SI3	The people in my social group think that I should use the Web site.
INT1	I intend to use the Web site again shortly.
INT2	I predict that I will use the Web site again in the short term.

*Item dropped

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