

## **The Impacts of Participating Social Networking Sites: A Study of University Students in Hong Kong and Wuhan in China**

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### **Abstract**

Social networking sites (SNS) facilitate individuals to update their profile and to interact with their close friends as well as their weak acquaintances. This study explores the impacts of these common activities. We hypothesize that these activities would boost one's self-esteem; would maintain one's social relationship; and would enable one to reach various information. This will result in the enhancement of one's life satisfaction. Our empirical findings from the usage of Facebook in Hong Kong and Xiaoneiin China prove most of our hypotheses. Individuals who exert time and effort updating their Facebook/Xiaonei gain more self-esteem. Interactions with close friends are significantly related to social relationship maintenance, but not to information sharing. Furthermore, interactions with weak acquaintances have greater effects on social relationship maintenance and information sharing than the impacts from interactions with close friends. These impacts would enhance one's life satisfaction.

**Keywords:** social networking sites, self-esteem, social relationship maintenance, reaching information, life satisfaction

## **Introduction**

With the growth of Web 2.0, social network sites (SNS) such as Facebook and LinkedIn are web-based services that allow individuals to (1) construct a public or semipublic profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2007, p. 211). Nowadays, hundreds of SNS exist across the globe, supporting a spectrum of users for their interests. These sites are oriented towards work-related contexts (e.g., LinkedIn.com), initiation of romantic relationship (the original goal of Friendster.com), connecting those with shared interests such as music or politics (e.g., MySpace.com), or college student populations (the original incarnation of Facebook.com). People use SNS to interact with people they already know, or to meet new people with shared interests. Instead of old-fashioned gatherings where people meet face-to-face, people use mobile phones to post photos of their recent activities and to view updates of their friends. In this regard, there is a trend of research on SNS for maintenance of social capital (Ellison et al., 2011; Ellison et al., 2007; Wellman & Gulia, 1999), and on how SNS for establishing connection (Seder and Oishi, 2012; Ellison et al., 2012; Tufekci, 2008; Ellison et al., 2007).

Furthermore, previous Internet studies on social effects have indirectly illustrated the possible relationship between the use of SNS and subjective well-being. More and more people believe that SNS genuinely connect people, thereby creating feelings of felicity (Bargh and McKenna, 2004). Past studies showed that use of SNS enhances life satisfaction (Erylimaz, 2012; Manago et al. 2012; Valenzuela et al. 2009; Ellison et al., 2007; Hawn, 2009; Howard, 2008). However, not many studies addressed the reasons behind. Through three common activities in SNS (updating one's webpage in SNS, interactions with close friends, and interactions with weak acquaintances), we argue that the self-esteem and the social capital of

an individual will be established; and information will be available in a more effective way. Along with positive psychology and related theories like Maslow's (1970) Need Hierarchy Theory and Self-Determination Theory (Deci and Ryan, 1985), life satisfaction will be enhanced upon the fulfillment of innate psychological needs. In this study, we attempt to explore the impacts of SNS through two surveys: university students using Facebook in Hong Kong and using Xiaonei in Wuhan, China.

### **Theoretical Framework**

A social network refers to the set of actors and ties among individuals with others (Compton, 2005; Correll & Park, 2005). There are three essential activities among participants in a social network site: 1) interactions with close friends, 2) interactions with weak acquaintances and 3) updates on one's own webpage. Usually, interactions with close friends are initiated by the posts from one's close friends, who either update their profiles or post some photos of their recent activities in a SNS. Interactions with weak acquaintances are started by the receiving of news from some interest groups in a SNS. In this study, weak acquaintances refer to people who do not know one another well and who occasionally meet, whereas close friends are people who know one another well and meet more often. Moreover, the social networks among close friends are usually connected in both physical and virtual environments. The following discussion will elaborate the theoretical framework as shown in Figure 1 of this study in details.

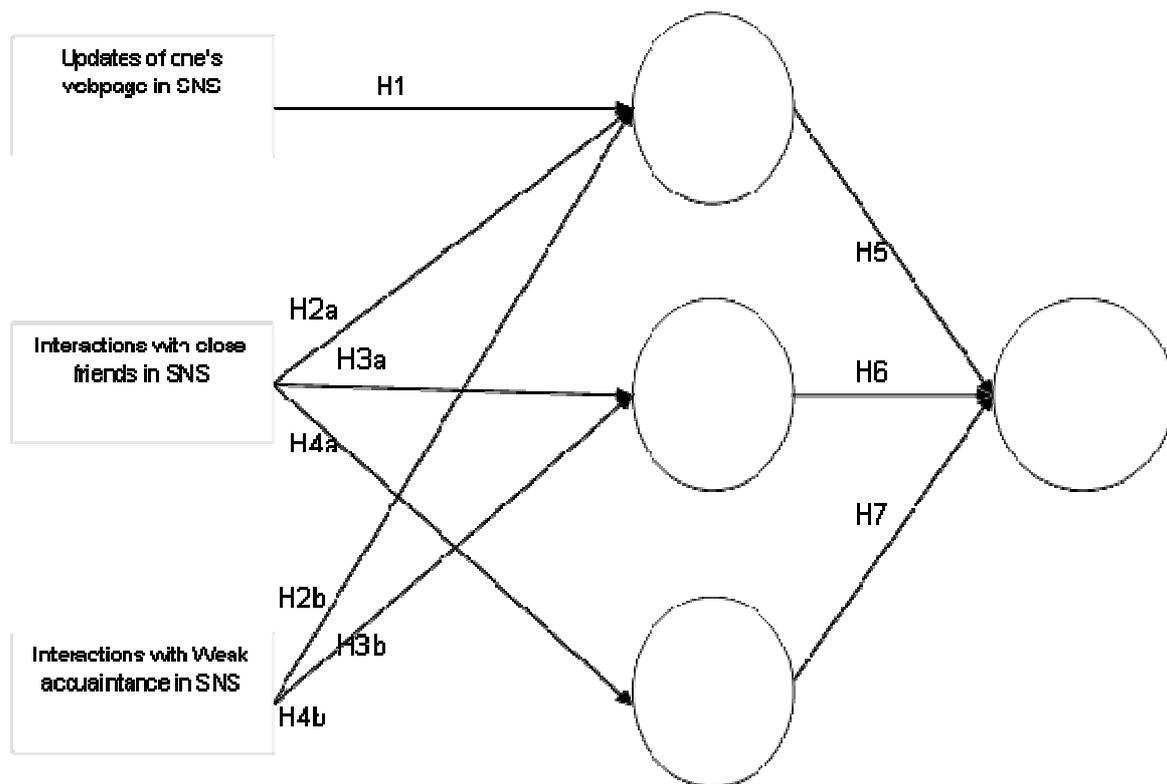


Figure 1. Theoretical Model

In psychology, self-esteem reflects a person's overall evaluation or appraisal of his or her own worth (Rosenberg, 1979). Many early theories suggest that self-esteem is a basic human need. For instance, Maslow (1987) includes self-esteem in his theory of hierarchical needs. He asserted that self-esteem is established by recognition, acceptance, and appreciation from others. Burke and Cast (2002), in their theory of self-esteem, also mentioned that people seek opportunities to verify their own identities.

Today, SNS are convenient places for people to create opportunities for self-verification. People in SNS selectively and volitionally post their photos to share their experience of their recent activities such as traveling, dining and doing sports. They may want to show what they are capable and to influence others in doing something similar. These posts will be pushed to his/her friends ubiquitously over various platforms such as mobile phone, tablet, or desktop computer. In usual, positive feedback will be received instantly.

According to Burke & Cast (2002) and Steinfield et al., (2008), an individual receives self-verifying feedback through appraisals during the interactions in the SNS, a feeling that one is accepted and valued by others is reinforced, consequently increasing self-esteem. Hence, the following hypothesis is proposed:

H1: The effort a person puts to updating his/her webpage in SNS would boost positively on his/her self-esteem.

Upon receiving news as posted by some close friends, or weak acquaintances via some interest groups, a person may respond and interact with these people. These interactions will eventually help to establish the social identities of a person within different social groups. These social groups would be formed by a clan of close friends, who are ex-classmates in a university, or by people with shared interests (e.g. photography) in SNS. Based on the social identity theory (Tajfel and Turner, 1979), interaction in a social group indicates one's identity. That is, the status of being in a group may serve to boost one's self-esteem. Recognition from a group through regular interactions in SNS raises one's self-image. People in a certain social group may prefer to use "we" instead of "I" to present themselves as belonging to the group. In this regard, the projection of group image may fall on the self-esteem of a person. Moreover, Bandura (1995) showed that high-quality contributions to a group can help an individual believing he/she has an impact on the group, thereby supporting his/her own self-image as an efficacious person. In sum, one may enforce his/her self-esteem if he/she is actively involved in maintaining social networks among close friends as well as among weak acquaintances. Thus, the following hypotheses are suggested.

H2a: Interactions with weak acquaintances in SNS has a positive impact on self-esteem enhancement.

H2b: Interactions with close friends in SNS has a positive impact on self-esteem enhancement.

Active SNS users would easily maintain their relationships with weak acquaintances and with close friends. First, it is quite common to send greetings on special occasions such as birthdays, Thanksgiving, New Year, or Christmas via SNS (Steinfeld et al., 2008). Second, active SNS users participate in social networking activities may express their moods using the rich media provided by a social networking site. Afterwards, their friends (weak acquaintances, or close friends) in the SNS would leave messages on their webpages or send electronic gifts to show empathy. Hence, they receive compassion when they are sad and encouragement when they are frustrated. Third, different stages of life such as entering university or college, moving to a new residence, graduating, and entering the professional workforce interrupt people's relationship with one another (Cumming et al., 2006). SNS allow people to maintain relationships with their previous social networks, while still being open to new experiences in their current geographical context (Steinfeld et al., 2008). Encouragement and acceptance, via messages and other facilities provided in SNS, are received from close friends, or newly made acquaintances can help a person to fit in with a new environment (Burke and Cast, 2002). Furthermore, Shaw and Gant (2002) found that perceived loneliness and depression decrease, and social relationship support increases following engagement in online chat sessions. It may also happen in SNS such as Facebook and Xiaonei which both have a chat function. In sum, interactions with weak acquaintances, or close friends via SNS may help relationship maintenance and the following hypotheses are predicted.

H3a: Interactions with weak acquaintances in SNS may result in social relationship maintenance.

H3b: Interactions with close friends in SNS may result in social relationship maintenance.

The impact of interactions with weak acquaintances would be higher on social relationship maintenance than interactions with close friends. This happens because close friends would be more intimate and possess a closer relationship. The kind of background knowledge and history with a person may put close friends in a more stable position that social networking activities are not likely to significantly interrupt. However, SNS would be an effective platform to maintain the relationship with weak acquaintances whom one does not know well and rarely meet.

H3c: Interactions with weak acquaintances creates a stronger impact on social relationship maintenance compared with close friends.

In addition to social capital maintenance, the second major reason of participating SNS is information seeking and sharing, which fulfill the motive of curiosity (Morgan and King, 1970), information need (Wilson, 1981) and decision support. Nowadays, people share their experience and interest with others in SNS. The information seeking in SNS is also very easy. With a few simple clicks, a person can post questions regarding the information they are seeking for to all of his/her friends in SNS. Past studies on weak ties have demonstrated that friends are not only helpful for job hunting (Lin, 1988), they are also useful for providing technical advice (Constant et al., 1996). Nevertheless, only public information is shared among weak acquaintances (Granovetter, 1973). On the other hand, close friends can use the chat function in SNS for sharing sensitive information. Moreover, close friends would interact via SNS by posting interesting information to each other. Hence the following hypotheses are outlined.

H4a: Interactions with weak acquaintances in SNS enhances information sharing.

H4b: Interactions with close friends in SNS enhances information sharing.

Comparing the information being shared among close friends and weak acquaintances, close friends may share more sensitive information via communication means that are more private, whereas weak acquaintances would share more on public information via public channels in SNS (Granovetter, 1973). Thus, the interactions with weak acquaintances via SNS may have greater impact on information sharing than that with close friends, given that public information would most likely be shared in SNS. From the above arguments, the following hypothesis is predicted.

H4c: Interactions with weak acquaintances creates stronger impact compared with close friends on information sharing.

Life satisfaction stems from the judgmental process by an individual (Diener et al., 1985); it is an overall assessment of one's quality of life (Shin & Johnson, 1978: p.478). In past studies (e.g., Diener et al., 1985; Diener & Diener, 1995; Neugarten et al., 1961; Pempek et al., 2009), life satisfaction has served as an index for happiness. In terms of social networking activities, Howard (2008) suggested that people who participate in social network sites are happier than those who do not. Hawn (2009), in her study of social networking in healthcare, also stated that social media such as Facebook would lead to the happiness of patients. Similarly, Ellison et al. (2007) also found that students with low level of life satisfaction would benefit more from the usage of Facebook for bridging social capital. Hence, we suspect their life satisfaction would be raised after using Facebook for a lengthy period. Here, we attempt to explore the mechanism behind the enhancement of life satisfaction of a person while engaging in SNS activities. This is based on Maslow's (1970) need hierarchy theory, and

self-determination theory (Dier and Ryan, 1985) which treat life satisfaction as a function of need satisfaction. The following elaborates on the mechanism why establishing self-esteem, maintaining social relationship and sharing information would lead to life satisfaction enhancement.

In the literature, self-esteem and life satisfaction are correlated (Diener&Diener, 1995; Kwan et al., 1997; Valkenburg et al., 2006). According to Maslow (1987), fulfillment of esteem needs to induce positive feelings regarding one's self: feelings of self-confidence, worth, strength, capability, adequacy and competence. This, in turn, generates a profound happiness and richness in one's inner life. Given that life satisfaction is a subjective judgment of one's life, positive self-evaluations are clearly important to one's feelings of life satisfaction. Therefore, we propose that the following hypothesis.

H5: Self-esteem enhancement in SNS has positive impact on life satisfaction enhancement.

According to Barnes et al.(1954), House (1981) and Li (2011), social relationships promote happiness, or help people cope with stressful events. Lawrence and Nohria(2002) stated that all humans have an innate drive-to-bond, to form social relationships, and to develop mutual caring commitments with other human beings. A person's innate drive-to-bond is fulfilled only when they develop and maintain mutual caring with others. Thus bonding for existing friends and maintaining existing social relationship is vastly important for life satisfaction.

H6: Social relationship maintenance in SNS has positive impact on life satisfaction enhancement.

Ellison et al. (2007) mentioned that people who stay longer with a social network benefit from sourcing information. When a person has access to various information sources, they are more able to cope with difficulties, have more opportunities, and gain more benefits (Ellison et al., 2007, p. 1163). Lawrence and Nohria (2002) explained that the drive-to-explore happens when people observe something interesting. After they have acquired information from their social network, the drive-to-explore would be satisfied. Consequently, information obtained from SNS would enrich the life satisfaction of a person. Therefore the following hypothesis is proposed.

H7: Information sharing in SNS has positive impact on life satisfaction.

### **Methodology**

To test the research framework, we developed a questionnaire to measure the constructs. Each construct consisted of statements against which respondents were asked to rate their level of agreement (ranging from strongly disagree to strongly agree on a 7-point Likert scale). The items for measuring the constructs were derived from previous studies. The Scale of Life Satisfaction was adapted from the Life Scale (Diener et al., 1985). Accordingly, items such as “I feel happier after using Facebook” were adjusted slightly to fit into the context of SNS. Items for self-esteem enhancement, such as “After using Facebook, I feel more positive towards myself,” were adapted from Burke and Cast (2002). On the items related to social relationship maintenance, we referred to the scale of Socially Supportive Behaviors (Barreara et al., 1981) and adopted items such as “Facebook helps me feel more socially acceptable.” For the information-sharing construct on actual Facebook usage, we used behavioral items such as “I use Facebook for information searching” extracted from Rafaeli and Raban (2005). The constructs relating to interactions with weak acquaintances and close friends were modified from Ellison et al. (2007). The interactions with close friend construct consisted of

items such as “I use Facebook for interacting with people whom I know well and see frequently,” whereas items such “I use Facebook for interacting with people whom I do not know well and do not see regularly,” were used for measuring the construct interacting with weak acquaintance. With reference to Livingstone (2008), and Joinson(2008), most people like to share their experience or information by updating his/her webpage or posting photos on social networking sites. Based on these usual practices, we included items such as “When using Facebook, I spend much time updating my own page” to measure the updating webpage construct. Demographic data such as age, gender, and level of education were collected at the end of the questionnaire. The social networking site Facebook was surveyed in Hong Kong, whereas Xiaonei was examined in the Mainland China version.

A professional translator fluent in both Chinese and English was hired to translate the Chinese version of the survey to English. After the translation process, we verified both the English and Chinese versions to ensure they were of identical meaning before sending them out. The Chinese version was also back-translated to English to ensure both versions have identical meaning. The essential items in the survey are shown in Table 1.

Table 1: Items of essential constructs in the survey of Facebook.

<b>Updating webpage in Facebook</b>
I use Facebook for photos sharing. <b>(Ctrb1)</b>
When using Facebook, I spend much time updating my own page. <b>(Ctrb2)</b>
<b>Interactions with close friends</b>
I use Facebook for interacting with friends whom I know well and I see frequently. <b>(CLFD1)</b>
When using Facebook, I pay more attention to friends whom I know well and I see frequently. <b>(CLFD2)</b>

<b>Interactions with weak acquaintances</b>
I use Facebook for interacting with friends whom I do not know well and do not see regularly <b>(FD1)</b>
When using Facebook, I pay more attention to friends whom I do not know well and do not see regularly. <b>(FD2)</b>
<b>Self-Esteem enhancement (after using Facebook)</b>
I feel more positive towards myself. <b>(SifEst1)</b>
I feel I can do things as well as other people. <b>(SifEst2)</b>
I feel I have more to be proud of. <b>(SifEst3)</b>
On the whole, I feel more confident about myself. <b>(SifEst3)</b>
<b>Social Relationship maintenance</b>
Facebook helps to maintain relationships. <b>(Sspt1)</b>
Facebook helps me feel more socially acceptable <b>(Sspt2)</b>
<b>Information sharing</b>
I use Facebook for information searching <b>(Inf1)</b>
I share useful information in my Facebook with my friends. <b>(Inf2)</b>
I can find useful information on Facebook from other people's page <b>(Inf3)</b>
<b>Life Satisfaction enhancement (after using Facebook)</b>
I feel happier. <b>(LifeSat1)</b>
I enjoy my life more. <b>(LifeSat2)</b>
I am more motivated to do what I want to do. <b>(LifeSat3)</b>
On the whole, I satisfy with my life more. <b>(LifeSat4)</b>

Our framework would have differential impacts on SNS users under different cultural and social background. Hence, we surveyed the university students in Hong Kong and Wuhan in

China. Wuhan is situated at the crossroads of central China. With a history that dates back more than 3500 years, Wuhan retains much of the Chinese culture. It is less open when compared with Shanghai in which people are more westernized. In this regard, people in Wuhan would be a good representation of people in a collective culture and it would be reasonable to assume they have a stronger need on relatedness when compared with Hong Kong people. Hong Kong is a place where west meets east. Under one country two systems, Hong Kong is more similar to the US and UK. Hong Kong people are more individualistic and less collective when compared to mainland Chinese. As China is still a communist country, information flow is somehow under control especially when the information is politically sensitive. Hence the need on reaching information would be higher than those people in Hong Kong. On the other hand, people in Hong Kong are more individualistic, their needs on identification would be higher than people in China. With these differences, it is interesting to compare their differential impacts on life satisfaction enhancement upon participating SNS.

In this study, university students are sampled. They are the frequent participants on the three essential SNS activities (updating a webpage, interactions with close friends and with weak acquaintances). Compared with those working classes, studying the life satisfaction of university students is less complicated as the life goals of students would be focusing on learning and social networking. Their life satisfaction will be more related to self-esteem establishment via self-esteem enhancement, relatedness via relationship maintenance and reaching information via sharing information. Besides self-esteem, relatedness, and reaching information, life satisfaction of workers would be related to job satisfaction, financial needs, and work-life balance (Erdogan, et al. 2012). Moreover, university students were chosen for our survey because they are the pioneer users of SNS and they are the digital natives of the

information age (Vodanovich et al. 2010). Thus, their perception and experience of using SNS would give us a comprehensive picture of the impact of SNS on their lives.

The survey in Hong Kong was conducted by randomly distributing the questionnaires to students of the Hong Kong Polytechnic University in the hostels, libraries, canteens, and classrooms during the students' break time. Given that the target population comprised students who use SNS, the questionnaire was only distributed to respondents who use SNS in their daily lives. The survey in Mainland China was conducted mainly by sending the electronic version of the questionnaire to a group of students in Wuhan University and Hubei University in the Wuhan, the capital city of Hubei province in China. These two universities are prominent universities in Wuhan. Most of them are via our Hong Kong connection with these Mainland China universities.

Both surveys were conducted in March 2010. To improve the response rate, we informed the respondents that we would strictly maintain the confidentiality of the respondents. However, some respondents left the questionnaires blank, filled in the questionnaire with the same score for every question, or answered the questions with special patterns. In order to have wide circulation with valid response from SNS users, we attempt to limit the length of the questionnaire so that most of the respondents can fill in the questionnaire within 10 minutes. This short timeframe would help respondents retain their attention throughout the questionnaire rather than just filling in some random answers close to the end. In this regard, some of the constructs just have two items. Nevertheless, we checked that most of the responses make sense of their answers. The respondent rate in Hong Kong was 83%, whereas it was 86% in Mainland China. To minimize data entry errors, all the collected data were checked for consistency. There were 23 questionnaires voided in Hong Kong survey, and 12

questionnaires voided in Mainland China one. Accordingly, 318 valid questionnaires were collected in Hong Kong, and 339 valid ones were collected in Wuhan. The duplicate responses and those that had too many missing values were removed. The profiles of the respondents from Hong Kong and Wuhan are shown in Table 2. Age range was from 18 to 25 as the samples are students studying in universities. In particular, the students in Hong Kong Polytechnic University were studying for their master’s degree; thus, their ages ranged from 31 to 40. This reflects the normal student profile in Hong Kong universities where people are studying their master’s degree after some years of working experience. Moreover, the student sample from Wuhan universities also reflects the norms of university students in Wuhan.

Table 2: Profile of Survey Respondents

<b>Region</b>	<b>Hong Kong</b>	<b>Wuhan</b>
<b>Education Level</b>		
<b>Under-graduate</b>	<b>252</b>	<b>217</b>
<b>Post Graduate</b>	<b>62</b>	<b>116</b>
<b>Gender</b>		
<b>Male</b>	<b>199</b>	<b>212</b>
<b>Female</b>	<b>119</b>	<b>127</b>
<b>Age</b>		
<b>18–25</b>	<b>240</b>	<b>326</b>
<b>26–30</b>	<b>12</b>	<b>12</b>
<b>31–40</b>	<b>59</b>	<b>1</b>

### **Analyses and Findings**

Since our analyses include the reliability and validity verification, structural model fit, multigroup measurement invariance testing, and mean comparison of latent constructs across groups, it is appropriate to use AMOS 7.0 for the comprehensive model fitting and testing.

Convergent validity of the measurement scales was evaluated using the two criteria suggested by Fornell and Larcker(1981) and Nunnally(1978): (1) all the indicator factor loadings should be significant and exceed 0.70, and (2) the average variance extracted (AVE) for each construct should exceed the variance because of measurement errors for that construct (i.e., should exceed 0.5). The factor loadings of the 20 items, extracted from the principal component with varimax rotation methods, are shown in Table 3. All items exhibited a loading value higher than 0.7 on their respective constructs. Thus, acceptable item convergence on the intended constructs was achieved. The AVEs of the constructs, as shown in Table 4, were all greater than the variances due to measurement errors. Hence, both conditions for convergent validity were amply fulfilled.

Table 3: Results of Factor Analysis

	Hong Kong							Wuhan						
	Upd	CIFriend	Friend	SifEst	SS	Info	LifeSat	Upd	CIFriend	Friend	SifEst	SS	Info	LifeSat
<b>update1</b>	<b>.886</b>	.111	.123	.169	.177	.052	.119	<b>.901</b>	.112	.128	.093	.145	.136	.143
<b>update2</b>	<b>.940</b>	.072	.102	.116	.080	.048	.058	<b>.919</b>	.131	.021	.086	.053	.118	.146
<b>CIFriend1</b>	.072	<b>.944</b>	.103	.109	.092	.004	.092	.123	<b>.962</b>	.040	.107	.056	.088	.064
<b>CIFriend2</b>	.106	<b>.919</b>	.067	.162	.114	.061	.157	.109	<b>.969</b>	.064	.055	.073	.075	.053
<b>WeakAcq1</b>	.170	.047	<b>.863</b>	.187	.223	.143	.117	.092	.011	<b>.915</b>	.114	.158	.104	.061
<b>WeakAcq2</b>	.083	.150	<b>.853</b>	.103	.199	.238	.174	.045	.090	<b>.933</b>	.120	.055	.069	.009
<b>SifEst1</b>	.084	.094	.087	<b>.896</b>	.098	.092	.203	.067	.062	.077	<b>.905</b>	.143	.083	.237
<b>SifEst2</b>	.090	.143	.103	<b>.904</b>	.073	.096	.207	.047	.082	.092	<b>.905</b>	.103	.067	.300
<b>SifEst3</b>	.091	.095	.055	<b>.918</b>	.086	.081	.185	.066	.052	.084	<b>.898</b>	.121	.067	.319

<b>SifEst4</b>	.089	.010	.094	<b>.871</b>	.104	.152	.271	.084	.044	.101	<b>.890</b>	.076	.036	.325
<b>SS1</b>	.143	.123	.206	.130	<b>.873</b>	.127	.262	.147	.075	.163	.205	<b>.840</b>	.270	.293
<b>SS2</b>	.142	.117	.226	.190	<b>.877</b>	.115	.215	.119	.110	.147	.227	<b>.837</b>	.270	.283
<b>Info1</b>	.040	.031	.096	.151	.033	<b>.929</b>	.120	.111	.095	.079	.038	.135	<b>.917</b>	.163
<b>Info2</b>	.037	.025	.141	.088	.096	<b>.922</b>	.131	.064	.068	.076	.056	.140	<b>.928</b>	.173
<b>Info3</b>	.032	.015	.102	.108	.095	<b>.937</b>	.127	.107	.029	.050	.101	.143	<b>.911</b>	.154
<b>LifeSat1</b>	.066	.065	.189	.193	.183	.053	<b>.853</b>	.144	.071	.009	.242	.127	.154	<b>.884</b>
<b>LifeSat2</b>	.054	.002	.066	.194	.148	.092	<b>.897</b>	.096	.044	.025	.231	.148	.155	<b>.903</b>
<b>LifeSat3</b>	.041	.133	-.044	.136	.094	.096	<b>.914</b>	.064	.024	.031	.241	.093	.129	<b>.914</b>
<b>LifeSat4</b>	.055	.079	.096	.227	.104	.158	<b>.882</b>	.066	.037	.046	.264	.138	.095	<b>.891</b>

Table 4: Squared Correlations, Reliability, and Average Variance Extracted

	Hong Kong							Wuhan						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1. Webpage update	<b>0.91</b>							<b>0.91</b>						
2. Interactions with close friends	0.36	<b>0.97</b>						0.36	<b>0.93</b>					
3. Interactions with weak acquaintances	0.23	0.20	<b>0.92</b>					0.41	0.27	<b>0.89</b>				
4. Self-esteem	0.35	0.23	0.30	<b>0.90</b>				0.39	0.34	0.31	<b>0.90</b>			
5. Social Relationship Maintenance	0.26	0.32	0.34	0.40	<b>0.84</b>			0.41	0.39	0.48	0.50	<b>0.88</b>		
6. Information Sharing	0.26	0.22	0.32	0.27	0.45	<b>0.92</b>		0.28	0.21	0.43	0.31	0.41	<b>0.93</b>	
7. Life Satisfaction	0.34	0.17	0.15	0.59	0.37	0.27	<b>0.89</b>	0.29	0.40	0.22	0.49	0.48	0.34	<b>0.90</b>
<b>Cronbach's alpha</b>	0.89	0.97	0.88	0.98	0.96	0.95	0.98	0.93	0.95	0.89	0.96	0.95	0.95	0.96
<b>AVE</b>	0.83	0.93	0.85	0.81	0.70	0.84	0.79	0.83	0.87	0.80	0.81	0.77	0.86	0.81

The correlation matrix of the data set is shown in Table 4. This enables us to examine all potentially overlapping constructs. If the items comprising a construct do not overlap markedly with other constructs (i.e., the AVE of a construct is larger than its squared

intercorrelations with other constructs), then discriminant validity of the construct is assured (1981). Table 4 shows that the diagonal elements (reporting the square root of the variance shared between a construct and its measures) are all higher than the correlations between target constructs without exceptions, suggesting discriminant validity of all the constructs in this study.

Reliability refers to the extent to which a construct is free from errors and yields consistent results. As shown in Table 4, Cronbach's alpha was used to measure the internal consistency of the multi-item scales used in this research. Because the Cronbach's alpha values of all the constructs were over 0.7 for both surveys in Hong Kong and Wuhan, they can all be claimed as reliable. Moreover, as all of the measures of the constructs have been used in previous studies; and the questionnaire was validated by experts in the fields of IT and behavioral science before its administration, the content validity of all the constructs is deemed acceptable.

We conducted the Harmon one-factor analysis suggested by Podsakoff and Organ (1986) to check the existence of common method bias. For both surveys, a factor analysis combining every variable in the research framework did not detect a single factor explaining the majority of covariance. Furthermore, results of the structural models showed different degrees of significance for path coefficients. The above evidence collectively suggests that common method bias is not a serious concern in this study.

Judging from the standard deviations of all the items, the sampled data have enough variations to represent the population, which include students who have experience using SNS. This is especially important; despite our filtering out of students unfamiliar with SNS,

the resulting sample still contained adequate variations. The means of the items, as shown in Table 5, suggest that the respondents were active on webpage updates and visiting webpages of weak acquaintances and close friends. They were also positive on social relationship maintenance via SNS. In particular, for Wuhan students, they were also positive toward SNS as an information-sharing channel. As a whole, there were signs of positive enhancement on their life satisfactions after using SNS.

After conducting the measurement invariance, as described by Doll et al.(1998) and Steenkamp and Baumgartner (1998),mean differences between the two samples are meaningful. On one hand, university students in Wuhan are more in favor of interactions with close friends and weak acquaintance and have stronger needs on social relationship maintenance and information sharing when compared university students in Hong Kong. This would be due to the collective culture in China which is under the control of a communist party. Moreover, SNS also facilitate social relationship maintenance and information sharing in a wider spread of geographies like China. On the other hand, the web page and photos' updates are more common for university students in Hong Kong comparing those in China. This is along with people in Hong Kong who are more individualistic than Wuhan. Overall, the enhancement in life satisfaction after using SNS is statistically at a higher level for university students in Wuhan than those in Hong Kong.

Table 5: Descriptive Statistics and Reliability of Constructs

Construct (a)	Hong	Wuhan	Differences <sup>b</sup>
	Mean (S.D.)	Mean (S.D.)	Mean (HK) – Mean (China)
Webpage update (2)	4.48(1.62)	4.12(1.55)	0.36***
Visiting close friend webpage (2)	4.34(1.46)	4.68(1.60)	-0.34***
Visiting weak acquaintances	4.35(1.28)	4.72(1.51)	-0.37***
Self-esteem (4)	3.43(1.14)	3.78(1.44)	-0.35***
Social Relationship Maintenance	4.69(1.29)	5.02(1.43)	-0.33***

Information Sharing (3)	3.79(1.40)	5.11(1.35)	-1.33***
Life Satisfaction (4)	3.83(1.10)	4.28(1.23)	-0.45***

- a. The number in parentheses indicates the resulting number of items in the scale
- b. All the differences are significant with p-value < 0.001

Table 6: Structural Model Fit

Fit Indices	Hong Kong	Wuhan	Desired Levels
$\chi^2/df$	1.682	1.698	< 3.0
CFI	0.961	0.971	> 0.90
TLI	0.955	0.965	> 0.90
RMSEA	0.051	0.043	< 0.08
Standardized	0.0412	0.0389	< 0.08
GFI	0.919	0.918	> 0.90
AGFI	0.895	0.901	> 0.80

Next, we proceeded to evaluate independently the structural model fit for each group. Table 6 shows the indices of both structural models complying with the combinational rule on desired levels on various fitness from Hu and Bentler (1999), providing evidence of a good model fit. Figure 2 illustrates the structural models for data from Hong Kong and Wuhan.

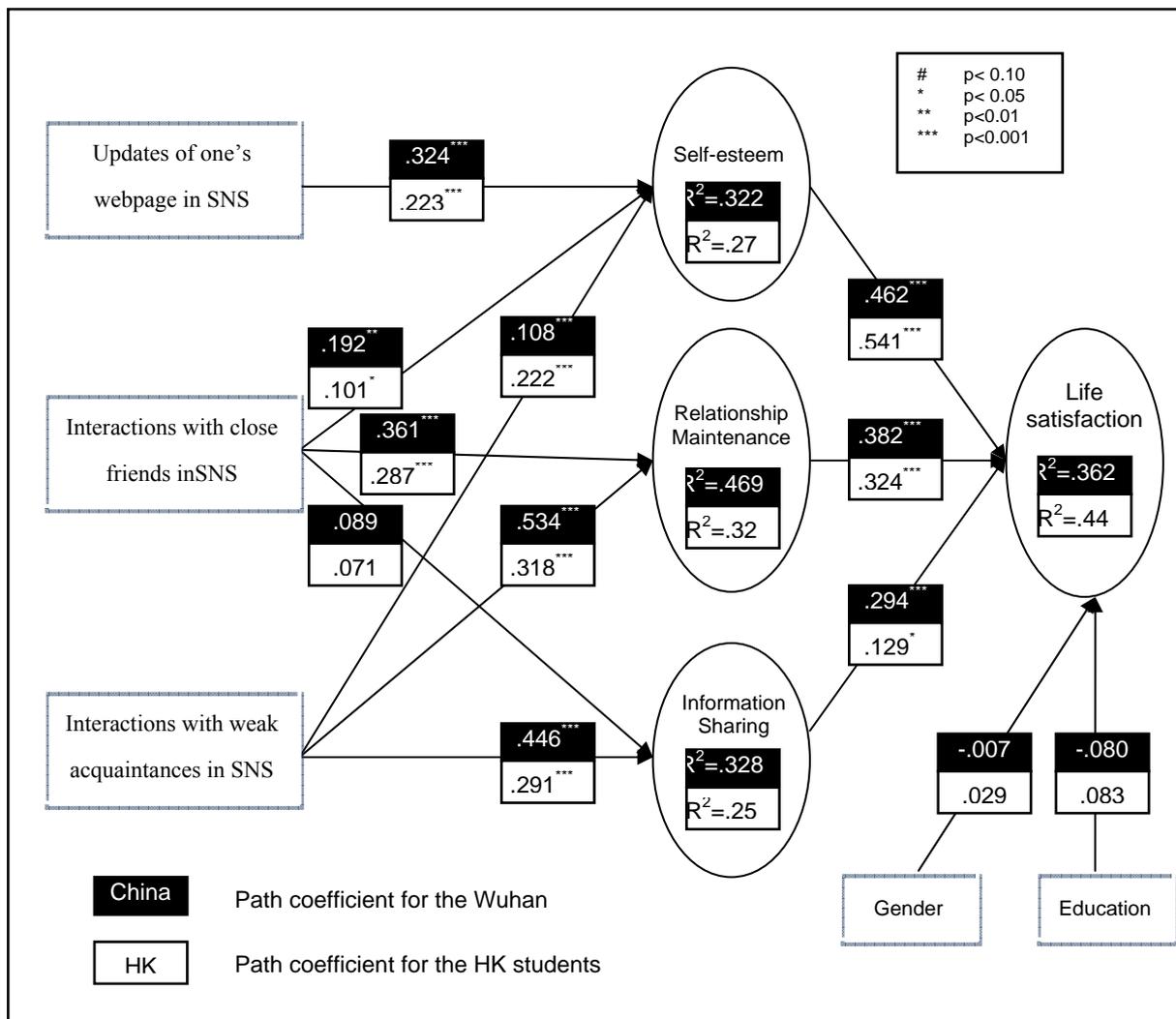


Figure 2. Structural Models (Hong Kong vs. Wuhan)

Both structural equation models indicate that the control variables – education and gender do not have significant relationship on life satisfaction enhancement after using SNS. From our analyses, updates of one's webpage in SNS have a significant impact on self-esteem enhancement. Interactions with close friends have significant impact on self-esteem enhancement and social relationship maintenance. Interactions with weak acquaintances have significant impact on self-esteem enhancement, social relationship maintenance, and information sharing. Moreover, self-esteem enhancement, social relationship maintenance, and information sharing are all significant to life satisfaction enhancement. Results show that H1, H2a, H2b, H3a, H3b, H4b, H5, H6, and H7 are supported in both samples. Nevertheless,

H4a, suggesting that interactions with close friends have an impact on information sharing, is not supported.

As per Cohen and Cohen (1983), the equation to compare relative strengths of the associations between constructs is used to test our hypotheses 3c, and 4c:

$$T=(r_{xz}-r_{yz}) \cdot \text{sqr}((n-3)(1+r_{xy}))/\text{sqr}(2 \cdot (1-r_{xz}^2-r_{yz}^2-r_{xy}^2+2r_{xz} \cdot r_{yz} \cdot r_{xy}))$$

Hypothesis 3c proposes that interactions with weak acquaintances have a stronger impact on relationship maintenance than those of close friends. With  $x$ =interactions with weak acquaintances,  $y$ =interactions with close friends,  $z$ =relationship maintenance, and  $n$ =Hong Kong sample size (318); the results  $r_{xy}=0.20$ ,  $r_{yz}=0.32$ ,  $r_{xz}=0.34$ , and  $T=0.31$  ( $p>0.05$ , one-tailed test) reject Hypothesis 3c for university students in Hong Kong. In the case of Wuhan with  $n=335$ ,  $r_{xy}=0.27$ ,  $r_{yz}=0.39$ ,  $r_{xz}=0.48$ , and  $T=1.58$  ( $p<0.05$ , one-tailed test), Hypothesis 3c for Wuhan students is supported.

Hypothesis 4c proposes that the positive impact from interactions with weak acquaintances on information sharing is stronger than that from interaction with close friends. This is somehow confirmed as both surveys show that the interactions with close friends are not positively related with information sharing. Nevertheless, we attempt to reconfirm with Cohen's statistical testing by the following substitution.  $x$ =interactions with weak acquaintances,  $y$ =interactions with close friends,  $z$ =information sharing and  $n=318$  for Hong Kong students, results show  $r_{xz}=0.32$ ,  $r_{yz}=0.22$ ,  $r_{xy}=0.20$ , and  $T=1.49$ , at the 0.05 level, confirming that interactions with weak acquaintances have stronger impact on information sharing. In the case of Mainland China,  $r_{xz}=0.43$ ,  $r_{yz}=0.21$ ,  $r_{xy}=0.27$ , and  $T=3.65$ , at the 0.05 level, also confirm that interactions with weak acquaintances have stronger impact. Accordingly, H4c is evidently supported in both places.

## **Discussion**

Our findings show hypothesis H1 is supported in both samples. This validates that updating one's webpage does establish one's self-esteem. This is because SNS users usually post their good aspects including those selected photos in their webpages. This is a kind of self-verification process. Eventually these good aspects will generate a good image of a person and be more attractive among their close friends as well as their weak acquaintances. This will then help the person to establish his/her self-esteem.

With respect to H2a and H2b, interactions with close friends and weak acquaintances have impacts on establishing one's self-esteem. This is because through social interactions, one would be recognized within the social group. Thus the related social identity will raise one's self-esteem. Our findings from H3a and H3b show that SNS provide a suitable environment for university students to maintain relationships with close friends and weak acquaintances. As indicated in our findings of the Wuhan sample on hypothesis H3c, the impact of interactions with weak acquaintances have a greater effect on social relationship maintenance when compared with the interactions with close friends. In this regard, our findings are somehow in line with current literature that SNS usage in China is more toward a weak tie social space (Fu and Zhang, 2011).

Interactions with close friends who know one another well and meet one another more frequently is primarily face-to-face or through personal communication channels, such as email, mobile phones, or Whatapps. Thus, close friends may not prefer to use SNS for information sharing as they have so many other choices, which are more convenient, personal and private. In usual, SNS require logging on to a website with Internet connection, and the issues discussed in SNS are almost public. Hence, SNS would be a preferable platform for

information sharing among weak acquaintances whom do not know one another well and rarely meet one another. It is reasonable that those weak acquaintances may not know each other's email and mobile phone number, and the information being shared is less sensitive. This would explain why H4b is supported while H4a is not supported. As a consequence, the impacts of interactions with weak acquaintances are also higher on information sharing as compared with interactions with close friends as validated in H4c.

Comparing the two samples, the impacts of interactions of weak acquaintances on information sharing are higher in university students of Wuhan than those in Hong Kong. It would be due to the fact that university students in China come from different provinces/counties (Brown & Park, 2002). They would likely have different exposures and backgrounds, and sharing information among themselves would be more interesting than those people coming from similar backgrounds within a local geography, such as Hong Kong. Additionally, IDD calls in China are expensive, thereby attracting people to use free Internet services such as QQ or SNS to maintain relationships with one another.

Concerning the ultimate impact on life satisfaction, our findings on hypotheses H5, H6 and H7 show that enhancement on self-esteem, relationship maintenance and information sharing are all significant. Nevertheless, information sharing has less impact on life satisfaction enhancement for Hong Kong students than that of Wuhan students. This reflects that people in Hong Kong share their information via different means in a more convenient way (Townsend, 2001).

## **Conclusion**

As with all empirical research, this investigation has several limitations. A notable weakness lies in the cross-sectional research design, where all measurement items were collected at the same point in time. Given that the investigated constructs are not supposed to remain unchanged over time, this research method may not fully capture the influence of SNS usage along the time. This constraint limits the extent to which causality can be inferred.

This study only offers insight on comparing the impact of SNS usage without reference to non-users. Furthermore, given the intricacy of student activities on SNS, factors such as students' interest and usage pattern in SNS may all potentially affect the findings. Whereas the present study emphasizes the key constructs that would cause life satisfaction of students after engaging SNS, future research should investigate the impact of SNS usage on life satisfactions of the working class.

Furthermore, the relationship between interactions with friends and self-esteem may be mutual rather than one-directional. It is because people with high self-esteem may tend to update his/her webpage more so as to share their interest and recent activities. Nevertheless, our model limits to the impact of SNS usage on self-esteem but not the reverse direction.

Finally, we are more reserved about our findings on university students in Hong Kong and Wuhan in China where our surveys were conducted. Though we argue that university students in Hong Kong and Wuhan are representative of most educated users of SNS in Hong Kong and China, the generalizability of the results would still be limited to university students but not SNS users in general.

This study empirically supports the theoretical model of life satisfaction enhancement upon using SNS. Individuals who exert time and effort updating their Facebook/Xiaonei gain more self-esteem. Interactions with close friends are significantly related to social relationship maintenance, but not to information sharing. Furthermore, interactions with weak acquaintances have greater effects on social relationship maintenance and information sharing than the impacts from interactions with close friends. These impacts would enhance one's life satisfaction.



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