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Jih-Hsuan Lin, Wei Peng, Mijung Kim, Sung Yeun Kim and Robert LaRose
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Jih-Hsuan Lin

National Chiao Tung University, Taiwan

Wei Peng and Mijung Kim

Michigan State University, USA

Sung Yeun Kim

Syracuse University, USA

Robert LaRose

Michigan State University, USA

Abstract

How do social media facilitate adjustment to changes in social structure and culture? This research examines the impact of online social networking on online and offline social capitals and adjustment of international students in the United States. A survey of 195 international students in a major Midwestern university showed that students' interactions with Americans and home country friends using Facebook, extroversion, and horizontal collectivism were positively related to international students' social adjustment and online bridging capital. Facebook usage mediated the relationship between extroversion and online social capital. The implications of social network site use, personality, and cultural difference on social capital and adjustment are discussed.

Corresponding author:

Jih-Hsuan Lin, Department of Communication and Technology, National Chiao Tung University, Taiwan

Email: tammyly2002@gmail.com

Keywords

adjustments, cultural differences, extroversion, Facebook, horizontal collectivism, international students, social capital, social network sites

How people adjust when encountering dramatic environmental and cultural change has been studied for decades (Kim, 2001). When going to college or getting a new job in a different city or country people have to adjust to new daily difficulties regarding life, academic or job performance, and their emotional attachment to family and friends they left behind (Ye, 2006). Recently, researchers have started to focus on how people use technology to manage their old and new social networks to gain social capital (Ellison et al., 2007) and to adjust both socially and psychologically (Ye, 2005, 2006).

Social network sites (SNSs) have received growing attention regarding their effects on social capital and psychological well-being (Ellison et al., 2007; Joinson, 2008; Stefanone et al., 2011; Steinfield et al., 2008). SNSs such as Facebook and MySpace are used to maintain pre-existing social ties and to create new connections. However, very few studies have examined the use of SNSs among sojourners. How does the use of SNSs among sojourners contribute to their social and psychological adjustments? Do cultural differences and personality traits influence sojourners' social capital and adjustment? The current study sheds light on how cultural differences as well as personality traits influence adjustment.

Literature review

Social capital and SNS use

Social capital is the construct that describes potential cumulated resources and benefits embedded in the relationships with other people (Coleman, 1988), such as emotional support, useful information, or financial aid assistance. Putnam (2000) distinguished two types of social capital, 'bridging' and 'bonding.' Bridging social capital consists of loose relationships (i.e., weak ties) which serve as bridges connecting a person to a different network, allowing the person to access to new perspectives and diffuse information (Lin, 2001). Bonding social capital provides emotional support through strong relationships (i.e., strong ties), such as family or close friends, which exert greater influences on people's interests and actions.

With the current trend toward spending more time online, attention has turned to how new, internet-based social networks have revolutionized the way people connect, interact, and network with each other (Ellison et al., 2007; Ferlander, 2003; Wellman et al., 1996). Online social networks can supplement or transform traditional face-to-face social interactions (Quan-Haase and Wellman, 2004). Wellman et al. (1996), for example, claimed that 'computer-supported social networks sustain strong, intermediate, and weak ties that provide information and social support in both specialized and broadly based relationships' (p. 213). Ferlander (2003) argued that the internet could provide, create, and maintain various types of social capital.

Although there has been some debate regarding whether social capital should be a cause, a process, or an effect, SNS researchers have treated and studied social capital as an outcome (Ellison et al., 2009; Stefanone et al., 2011; Steinfield et al., 2008). Built on

Putnam's work, Williams (2006) developed scales to measure bonding and bridging social capitals as outcomes resulting from one's relationships with others in both online and offline contexts. Benefits of bonding social capital include emotional support (e.g., 'When I feel lonely, there are several people online/offline I can turn to'), access to scarce or limited resources (e.g., 'The people I interact with online/offline would put their reputation on the line for me'), and the ability to mobilize solidarity (e.g., 'The people I interact with online/offline would help me fight an injustice'). On the other hand, bridging social capital consists of outward-looking behavior (e.g., 'Interacting with people online/offline makes me want to try new things'), connections with a broad range of people (e.g., 'Online/offline, I come in contact with new people all the time'), and viewing oneself as part of a larger group (e.g., 'Interacting with people online/offline makes me feel like part of a larger community').

Social network sites, especially Facebook, are a relatively new application of the internet that enables students to maintain previous connections and build new relationships during their transitions to their new environment (Ellison et al., 2007, 2009; Stefanone et al., 2011). A growing number of studies suggested that using SNSs would help form social capitals from interactions and connections among people (Donath and boyd, 2004; Resnick, 2001). Access to actual resources from bonding and bridging social capitals formed on Facebook was further demonstrated by a recent quasi-experimental study (Stefanone et al., 2011). Facebook in particular contains some features that could enable users to build and maintain a large amount of weak ties because of the easy management (Donath and boyd, 2004). Recent empirical research has shown a significantly strong relationship between college students' Facebook usage and their bridging social capital (Ellison et al., 2007). More recently, a longitudinal study has further indicated that using Facebook resulted in more bridging social capital (Steinfeld et al., 2008).

A recent survey conducted by University of Missouri-Columbia (2007) showed that 95 percent of American college students have an SNS profile. In particular, it has been found that Facebook is the dominant SNS for American college students (Anderson Analytics, 2007). In order to build new social networks and meet new people in the host country where Facebook is the main social networking tool, international students are likely to continue to use or adopt Facebook. On the basis of the literature discussed above, we expect that international students utilize Facebook to gain their bridging social capital. To avoid potential confounding factors which would influence international students' social capitals and adjustment, we controlled the following variables: age, gender, grade point average (GPA), and residence length in the USA.

H1: International students' Facebook usage will be positively related to their online and offline bridging social capital after controlling their age, gender, GPA, and residence length in the USA.

Past literature has shown that international students' social networks in the USA consist of groups from different countries, including co-national friends, international students from other countries, and US students (Hendrickson et al., 2010). In addition to the association between international students' Facebook usage and their social capital, it is important to explore whom international students interact with on Facebook and how these interactions predict their online and offline social capital. The following research question is thus proposed:

RQ1: How is international students' time spent on Facebook interacting with different groups related to their online and offline social capital?

Collectivism and individualism

For international students, a potential factor influencing their adjustment is the culture they come from and the degree to which they have adopted the norms of their new culture (Rosen et al., 2010). Among the five dimensions of cultural difference (Hofstede, 1984), collectivism and individualism have been widely adopted to examine the influence of cultural difference on individual and organizational behaviors (Lee and Choi, 2007). Collectivism generally refers to a social pattern of closely linked individuals who define themselves as interdependent members of a collective (e.g., family, co-workers), whereas individualism is considered as a cultural pattern stressing individual autonomy and independence of the self (Markus and Kitayama, 1991).

Researchers further distinguished between vertical and horizontal dimensions of collectivism and individualism based on the concept of equality (Lee and Choi, 2007; Singelis et al., 1995). For example, horizontal collectivism emphasizes the sense of cooperation, and perceives oneself as a part of the group, as well as views all members of the group as the same. In contrast, horizontal individualism emphasizes an individual's uniqueness and is built on the concept of the equality of every autonomous individual.

Horizontal collectivism and horizontal individualism are perhaps the most relevant to the present discussion of SNS because horizontal collectivism is reflected in common SNS activities such as 'tagging' photos or 'grouping' and horizontal individualism is present in unique profiles that individuals make for themselves. When international students travel to the United States, those who exhibit more traits of horizontal collectivism may seek more connections with other international and domestic students compared to those who exhibit more traits of horizontal individualism, thus leading to more bridging social capital. In addition, the former group may gain emotional support by cooperating with others and thus may have better adjustment. For example, if a fellow student won the prize, a person who exhibits horizontal collectivism would feel proud of the fellow student (Triandis and Gelfand, 1998) and might express this in an SNS venue by posting a congratulatory message on the prize winner's wall. This would increase social capital through frequently interacting with each other and diffusing information. People who exhibit horizontal individualism often 'do their own things' and mainly depend on themselves rather than others, and thus would mainly manage their own profile content.

More recently, collectivism and individualism have been introduced to studies regarding SNS behavior (Pearce, 2008; Rosen et al., 2010). However, these studies measured cultural differences at the national level as an explanation for manifest differences in social networking patterns. Triandis and Gelfand (1998) argued that the national level and individual level of culture differences are statistically independent. Consequently, we propose the following research question to study culture difference at the individual level:

RQ2: What is the relationship between cultural difference (horizontal collectivism vs. horizontal individualism) and international students' online and offline social capital after controlling age, gender, GPA, and residence time in the USA?

Extroversion

In addition to cultural difference, personality traits such as extroversion have been indicated as important factors influencing a person's communication pattern and psychological well-being in the online context (Bessière et al., 2008; Kraut et al., 2002). Mixed results were demonstrated in past research regarding the relationship between extroversion and online social capital. One type of proposition is that introverts may use SNSs more to connect with others and increase their social capital. Introverts tend to view and reflect their true selves online, whereas more extroverted people are prone to locate their true selves offline (Amichai-Hamburger et al., 2002; Orchard and Fullwood, 2010), because the online environment may provide a less intimidating environment for them to connect with others.

In contrast, it is also suggested that extroverts may use SNSs more and benefit more from online communication and SNSs. For example, people who established online relationships on Facebook tended to also communicate in real life, suggesting that extroverted individuals benefit from SNS more than introverted individuals (Sheldon, 2008). In addition, users usually meet people offline and later add these contacts to Facebook to manage their social networks, suggesting that SNSs usually facilitate relationship from offline to online (Ellison et al., 2007; Ross et al., 2009). Furthermore, more extroverted people are likely to use SNSs more frequently and engage on Facebook more actively, such as by having more connections, belonging to more groups, and using more features (Amichai-Hamburger and Vinitzky, 2010; Ross et al., 2009; Wilson et al., 2010). Whereas these recent studies explored the association between users' personality and their behavior on SNSs, this study further explored the association among users' personality, SNS usage, and their social capital outcomes. In addition, previous research only focused on how SNSs influence users' online social capital and largely overlooked users' offline social capital. As mentioned before, the affordances in SNSs allow users to manage a hybrid of both online and offline social networks. To address this gap, we have proposed the following research questions:

RQ3a: What is the relationship between international students' extroversion and their online and offline social capitals?

RQ3b: What is the relationship between extroversion and Facebook usage?

RQ3c: Does Facebook usage mediate the relationship between extroversion and online and offline social capitals?

Adjustment and social network sites

When people encounter life transitions such as starting a new job in another city or going to a different school, people have to adopt different social and cultural patterns in both psychological and sociological aspects. The stress resulting from such drastic changes often negatively affects people's psychological well-being (Ye, 2005).

Establishing a social network in a new environment is important for adjustment (Wang and Kanungo, 2004). Using the example of international students, Al-Sharideh

and Goe (1998) found that the connections between international students and other co-cultural students positively predicted their personal adjustment. However, for those who did not establish connection with other co-cultural students, the connections with American students then predicted personal adjustment.

Recent studies showed that the internet has positive impacts on social adjustment and psychological well-being for international students, a special group that is facing tremendous acculturation challenge (Kim et al., 2009; Ye, 2006). Ye (2006) found that international students who received more social support from their interpersonal networks in the United States and from online ethnic social groups had lower social difficulties. More recently, Kim et al. (2009) found that international students from South Korea used the internet to connect to South Korean students and local ethnic groups, as well as their social networks in their home countries. This allowed them to familiarize themselves with their new environment and adjust readily to cultural differences. Based on the previous findings, we formulated the following hypotheses:

H2: The time international students spend on Facebook connecting with home country friends will be positively related to a) social adjustment, b) emotional adjustment, and c) college attachment.

H3: The time international students spend on Facebook interacting with American friends will be positively related to a) social adjustment, b) emotional adjustment, and c) college attachment.

Existing literature has explored how cultural difference or personality affects users' SNS behavior. Yet we know little about how SNS usage in addition to the above individual differences affects international students' adjustments. This study thus explores the association between these constructs and adjustments.

RQ4: How do SNS use, horizontal collectivism, and extroversion predict a) social adjustment, b) emotional adjustment, and c) college attachment after controlling participants' age, gender, GPA, number of American friends, and residence length in the USA?

Method

Procedure

An online survey was conducted targeting the international students at a large Midwestern university. A survey invitation was sent out through email to all the international students (4215 in total) via the Office for International Students and Scholars (OISS), followed by a reminder email. We received 343 responses, yielding an 8.14 percent response rate. A total of 195 responses were obtained after we deleted cases which dropped out in the middle of the questionnaire. Missing data ranging from 1.5 percent to 10 percent were imputed with the sample means (Hair et al., 2006). We compared this imputed data set with the raw data set. No significant differences were found between these two sets of data.

Participants

Among the 195 responses, 62 were undergraduate students, 111 were graduate students, and 22 did not provide any indications. The average age of the sample was 26 years old, ranging from 18-year-old to 46-year-old with 30 missing responses. Half of the participants were female (49.7%), 38.5 percent were male, and 15.9 percent were missing values. Regarding the country origin, 63 percent were from Asian countries such as China, South Korea, Taiwan, India, Malaysia, Singapore, Japan, Philippine, etc., 6.7 percent from South and North Americas such as Canada, Colombia, Brazil, and Venezuela, 4.6 percent from the Middle Eastern countries, 3.6 percent from African countries, 3.1 percent from the European countries, and 18.9 percent missing responses. Among the 173 (22 missing data) valid responses, 42.8 percent have resided in the United States for more than two years, and the average length is almost two years ($SD = 1.03$). Almost 80 percent of 173 international students had the GPA from 3.1 to 4.0.

Measurements

Independent variables. Facebook usage was measured by 10 items consisting of different activities on Facebook ($M = 3.13$, $SD = 1.05$, $\alpha = .87$). Participants answered the following questions using a 7-point scale in which 1 represented never, 2 rarely, 3 monthly, 4 weekly, 5 multiple times a week, 6 daily, and 7 multiple times a day: How often do you 1) use Facebook applications (i.e., trivia, fan sites); 2) play Facebook games (i.e., Scramble); 3) send messages to 'friends' on Facebook; 4) chat with other Facebook friends; 5) check your 'events' on Facebook; 6) create 'events' on Facebook; 7) add/change your photos on Facebook; 8) check a Facebook friend's status; 9) use Facebook to check a Facebook friend's photos; and 10) change your Facebook status. Exploratory factor analysis showed that four items, including send messages, check events, check status, and check photos, loaded into the same factor ($M = 3.89$, $SD = 1.32$, $\alpha = .83$), which presented users' communication behavior on Facebook. Since communication activities (as opposed to playing games or using Facebook applications, for example) are the most relevant to social capital, we used this scale to measure Facebook usage.

To measure the time international students spend on Facebook with different friend groups, we first asked participants 'how often do you log on to Facebook?' Participants chose one answer from the following seven options: 0 (never), 1 (less than once a month), 2 (more than once a month but less than once per week), 3 (weekly), 4 (multiple times a week), 5 (daily), and 6 (more than once a day). Second, we asked participants to indicate the average time they spent on Facebook of each login from the following options: 1 (1–5 minutes), 2 (6–15 minutes), 3 (16–30 minutes), 4 (31–60 minutes), and 5 (more than 60 minutes). We recoded each option into the median value of the range of the minutes in order to estimate their Facebook usage time. For example, the first option, 1 to 5 minutes, was recoded into 3 minutes $[(1+5)/2]$. The last option, more than 60 minutes, was recoded into 60 minutes. Lastly, we asked participants to report the percentage of their time spent on Facebook with American friends and friends from their home country. Participants answered from the following items: 0 percent, less than 10 percent, 11–25 percent, 26–50 percent, 51–75 percent, 76–90 percent, and more than 90 percent. In

order to calculate the estimated percent, we recoded these options into the median value of the range. For example, less than 10 percent was recoded into 5 percent, 11–25 percent was recoded into 18 percent, and more than 90 percent was recoded into 90 percent.

Time spent on Facebook with each friend group was calculated by multiplying international students' frequency logging in Facebook by Facebook usage time and by the percentage they spent with different friend groups. For example, a person who logged in Facebook less than once a month (1), usually spend 1–5 minutes (3 minutes), and spend less than 10 percent of the time interacting with American (5%) received a score of 0.15 ($1 \times 3 \times 0.05$).

Regarding cultural differences, horizontal individualism (HI: $M = 5.24$, $SD = 1.37$, $\alpha = .85$) and horizontal collectivism (HC: $M = 5.37$, $SD = 1.02$, $\alpha = .87$) were measured by using scales developed by Triandis and Gelfand (1998). Both scales had four statements and participants rated the statements by indicating their levels of agreement using a 7-point Likert scale anchored by 1 (strongly disagree) and 7 (strongly agree).

The extroversion measure ($M = 5.10$, $SD = .89$, $\alpha = .80$) consisted of seven items from Bendig's (1962) Extraversion–Introversion scale that were presented as a 7-point scale anchored by 1 (strongly agree) and 7 (strongly disagree).

Dependent variables. Social capital was measured using the online and offline bonding and bridging capital measures developed by Williams (2006). Participants indicated their levels of agreement using a 7-point Likert scale anchored by 1 (strongly disagree) and 7 (strongly agree) on online bonding ($M = 4.02$, $SD = 1.15$, $\alpha = .87$), online bridging ($M = 4.69$, $SD = 1.16$, $\alpha = .92$), offline bonding ($M = 5.28$, $SD = .98$, $\alpha = .86$), and offline bridging ($M = 4.88$, $SD = 1.12$, $\alpha = .92$).

Social adjustment ($M = 5.47$, $SD = .86$, $\alpha = .88$) consisted of seven items. These were measured using the scales from Manual for Student Adaptation to College Questionnaire (Baker and Siryk, 1989). Example items for the social adjustment scale include 'I am very involved with college social activities' and 'I am satisfied with my social life.'

Emotional adjustment (Hurtado et al., 1996) was measured using both the psychological and physical subscales consisting of 14 items ($M = 3.38$, $SD = 1.06$, $\alpha = .90$). Example items include 'I feel tense or nervous' and 'I am not sleeping well.' Participants answered each statement using a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

College attachment ($M = 5.50$, $SD = 1.00$, $\alpha = .82$) was measured using the 4-item scale (Hurtado et al., 1996) with the 7-point Likert scale. Example items include 'I am pleased about attending this college' and 'I expect to finish my degree.'

Control variables. Participants indicated year of birth, sex, their length residing in the USA, and GPA. To measure the participants' number of American friends on Facebook, two questions were used. First, participants indicated their total number of friends on Facebook based on the following categories: 0–50, 51–100, 101–250, 251–500, and more than 500. Second, participants were asked to estimate the percentage of Facebook friends who were American from the following categories: 0 percent, less than 10 percent, 11–25 percent, 26–50 percent, 51–75 percent, 76–90 percent, and more than 90 percent. We then recoded the above options into the median value of the range and time both value together to obtain the estimated number.

Results

Sample

Among the 195 participants, 78.5 percent ($N = 153$) had used SNSs and 67.2 percent ($N = 131$) had used Facebook. Among the 131 Facebook users, on average, participants logged in to Facebook between daily and more than once a day. Eighty percent of these Facebook users spent less than 30 minutes every time they visited Facebook. Thirty-three percent of Facebook users had less than 50 friends on Facebook, 16.8 percent had 51–100, 22.3 percent had 101–250, and 19.6 percent reported more than 250 Facebook friends, with 15.4 percent missing data.

Because a previous study (Hargittai, 2007) showed that Facebook was not the dominating SNS of international students, we investigated whether the international students' usage of other SNSs would influence their Facebook usage and adjustments. Among 131 Facebook users, 71 participants indicated Facebook as their primary SNS and 60 participants indicated other SNSs as their primary SNS, which include Orkut, Friendster, Xiaonei, Cyworld, QQ, Wretch, and Mixi. We conducted analyses to compare these two groups. Results showed that there was no significant difference between these two groups regarding their time spent on Facebook, $F(1, 126) = .613, p > .05$, and the number of friends on Facebook, $F(1, 126) = .437, p > .05$. In addition, no significant differences were found between these groups on social capitals and adjustment outcomes.

Social capital and SNS usage

Hierarchical multiple regression showed that, after controlling age, gender, GPA, and residence length in the USA in the first model and controlling horizontal collectivism and extroversion as additional control variables in the second model, international students' Facebook usage was the only factor that significantly predicted online bridging capital ($\beta = .26, p < .01$), $F(7, 93) = 4.35, p < .001, R^2 = .25$ (see Table 1). However, as shown in Table 1, Facebook usage did not significantly predict offline bridging capital ($\beta = -.09, p = ns.$). Thus, H1 was partially supported.

RQ1 explored the relationship between interactions with different friend groups on Facebook and international students' social capital. The results of the hierarchical multiple regression presented in Table 2 indicated that after controlling age, gender, GPA, and residence length in the USA in the first model and controlling horizontal collectivism and extroversion as additional control variables in the second model, Facebook interactions with friends who were from the same country marginally predicted online bridging capital ($\beta = .01, p = .059, R^2 = .21$). The results in Table 2 also revealed that Facebook interactions with American friends positively predicted online bridging capital ($\beta = .003, p < .05, R^2 = .22$) but negatively predicted offline bonding capital ($\beta = -.01, p < .05, R^2 = .20$) and offline bridging capital ($\beta = -.01, p < .05, R^2 = .28$).

Cultural difference and social capital

RQ2 explored the relationship between cultural difference and international students' social capital. The results of the linear regression presented in Table 3 indicated that hori-

Table 1. Hierarchical multiple regression analysis for variables predicting international students' online and offline bridging capital.

	Online bridging capital		Offline bridging capital	
	β	t-value	β	t-value
Step 1				
Age	-.61	-2.71	-.04	-1.78
GPA	-.03	-.06	.84	1.94
Gender	.15	.65	.30	1.25
Residence length in the USA	.13	1.06	.02	.11
R^2 (%)	.21		.08	
Step 2				
Age	-.06	-2.53	-.03	-1.51
GPA	-.07	-.18	.73	1.84
Gender	.18	.77	.40	1.76
Residence length in the USA	.15	1.17	.04	.29
Facebook usage	.26	2.97**	-.09	-1.00
Horizontal collectivism	.10	.68	.19	1.39
Extroversion	.19	1.30	.41	2.84**
R^2 (%)	.25		.24	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

horizontal collectivism was positively correlated with online bridging capital ($\beta = .268$, $p < .05$, $R^2 = .165$) after controlling age, gender, GPA, and residence length in the USA. Horizontal collectivism also had a positive relationships with offline bonding capital ($\beta = .296$, $p < .01$, $R^2 = .116$) and offline bridging capital ($\beta = .385$, $p < .01$, $R^2 = .173$) after controlling the above control variables.

Extroversion, SNS usage, and social capital

RQ3a explored the association between extroversion and international students' social capital. Linear regression indicated that extroversion positively predicted online bridging capital ($\beta = .313$, $p < .01$, $R^2 = .06$), offline bridging capital ($\beta = .469$, $p < .001$, $R^2 = .14$), and offline bonding capital ($\beta = .29$, $p < .005$, $R^2 = .07$), but not online bonding capital ($\beta = .01$, *ns*).

RQ3b asked whether more extroverted international students would have higher Facebook usage. Linear regression showed that extroversion positively predicted Facebook usage ($\beta = .356$, $p < .01$, $R^2 = .055$).

RQ3c further investigated whether Facebook usage would mediate the relationship between extroversion and international students' social capital. The data demonstrated that the three steps of mediation process suggested by Baron and Kenny (1986) were all met. Results from RQ3 indicated the first step, in which extroversion predicted online bridging capital, offline bridging capital, and offline bonding capital. Results from RQ4 showed the second step, in which extroversion predicted Facebook usage. Finally, when adding both extroversion and Facebook usage into the regression with the dependent

Table 2. Hierarchical multiple regression analysis for variables predicting international students' online and offline social capital.

	Online bridging		Online bridging		Offline bridging		Offline bonding	
	β	t-value	β	t-value	β	t-value	β	t-value
Step 1								
Age	-.08	-3.60	-.08	-3.61	-.05	-2.09	.01	.44
GPA	-.09	.23	.03	.08	.80	2.02	.51	1.45
Gender	.19	.83	.15	.66	.28	1.24	.13	.67
¹ Length	.11	.87	.15	1.15	-.03	-.20	-.13	-1.06
R ² (%)	.17		.15		.12		.08	
Step 2								
Age	-.08	-3.20	-.08	-3.28	-.04	-1.73	.02	.79
GPA	.03	.07	-.02	-.05	.72	1.98	.46	1.39
Gender	.24	1.03	.21	.94	.37	1.74	.18	.91
¹ Length	.12	.94	.17	1.33	-.003	-.03	-.11	-.98
² Home	.01	1.91	-	-	-	-	-	-
³ American	-	-	.003	2.01*	-.01	-2.28*	-.01	-2.23*
⁴ HC	.11	.79	.14	.76	.25	1.92	.22	1.81
Extroversion	.20	1.33	.15	1.71	.31	2.19*	.19	1.51
R ² (%)	.21		.22		.28		.20	

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$.

¹ Residence length in the USA, ² Interactions with friends who were from the same country, ³ Interactions with American friends, ⁴ Horizontal collectivism.

variable of social capital, the magnitude and significance level of extroversion on online bridging capital decreased from $\beta = .356, p < .01$ to $\beta = .248, p < .05$. Facebook usage was a significant predictor on online bridging capital, $\beta = .29, p < .001$. This indicated that Facebook usage partially mediates the relationship between extroversion and online bridging capital. Facebook usage did not mediate the relationship between extroversion and the other types of social capital. A Sobel test (Sobel, 1982) confirmed that the partial mediation was statistically significant ($z = 2.19, SE = .05, p < .05$).

SNS usage and adjustments

H2 investigated the relationship between international students' interactions with home country friends and adjustments. The results showed that the time spent on interacting with home country friends using Facebook was positively correlated to social adjustment ($\beta = .01, p < .005$) and college attachment ($\beta = .01, p < .01$), but not to emotional adjustment ($\beta = -.01, ns$). Similarly, H3 investigated how international students' interactions with American friends on Facebook affected their adjustments. This was partially supported. International students' interactions with Americans using Facebook were marginally correlated to social adjustment ($\beta = .01, p = .066$), but not correlated with emotional adjustment ($\beta = .002, ns$) or college attachment ($\beta = .001, ns$).

Table 3. Linear regression analysis for variables predicting international students' social capital.

	Online bridging		Offline bridging		Offline bonding	
	β	t-value	β	t-value	β	t-value
Step 1						
Age	-.08	-3.61	-.04	-2.08	.01	.41
GPA	.01	.02	.77	1.99	.49	1.43
Gender	.11	.48	.23	1.05	.11	.54
Residence length in the USA	.11	.89	.05	.38	-.06	-.53
Horizontal collectivism	.27	2.32*	.39	3.50**	.30	2.94**
R ² (%)	.17		.17		.12	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Lastly, RQ4 explored the effects of SNS usage, horizontal collectivism, and extroversion on international students' adjustments. Hierarchical multiple regression showed that, after controlling age, gender, GPA, number of American friends on Facebook, and residence length in the USA in the first model and controlling horizontal collectivism and extroversion as additional control variables in the second model, Facebook usage ($\beta = .22, p < .001$), extroversion ($\beta = .40, p < .001$), and horizontal collectivism ($\beta = .24, p < .05$) predicted social adjustment, $R^2 = .463, p = .001$ (see Table 4). Regarding emotional adjustment, the hierarchical multiple regression shown in Table 4 with the same control variables showed that only extroversion was the significant predictor ($\beta = -.51, p < .001$), $R^2 = .22, p = .001$. The hierarchical multiple regression shown in Table 4 with the same control variables showed that only horizontal collectivism significantly predicted college attachment ($\beta = .46, p < .01$), $R^2 = .28, p = .001$.

Based on the regression results regarding RQ3a–RQ4, we proposed the structural model schematically shown in Figure 1. This figure illustrated the hypothesized model, which was tested using Amos (Amos, Version 18). The model fitted the data very well based on several goodness-of-fit statistics ($\chi^2/df = 1.24, \chi^2(35) = 43.55, p = .15, RMSEA = .04, GFI = .96, AGFI = .93, CFI = .99, RMR = .10, NFI = .96$). Figure 1 also showed the standardized coefficients. Specifically, the results indicated that Facebook usage, extroversion, and horizontal collectivism had significant relationships to social adjustment ($\beta = .20, p < .001$; $\beta = .29, p < .001$; and $\beta = .31, p < .001$, respectively). Extroversion predicted emotional adjustment ($\beta = -.24, p < .001$) and horizontal collectivism predicted college attachment ($\beta = .31, p < .001$). Facebook usage had a significant indirect effect on extroversion and online bridging capital.

Discussion

This study extended the previous literature regarding SNS usage and social capital (Ellison et al., 2007; Steinfield et al., 2008; Stefanone et al., 2011) by focusing on the role of SNSs in people's social capitals and adjustments when making life transitions. International students served as a special group for us to study because they encountered

Table 4. Hierarchical multiple regression analysis for variables predicting international students' social adjustment, emotional adjustment, and college attachment.

	Social adjustment		Emotional adjustment		College attachment	
	β	t-value	β	t-value	β	t-value
Step 1						
Age	-.01	-.52	.03	1.20	-.04	-1.71
GPA	.47	1.16	-.71	-1.43	.52	1.23
Gender	.12	.57	-.17	-.66	.24	1.11
Residence length in the USA	-.04	-.36	-.01	-.05	-.06	-.48
Number of American friends	.07	3.47	-.04	-.17	.03	1.37
R ² (%)	.15		.30		.31	
Step 2						
Age	-.03	-1.61	.046	1.80	-.04	-1.86
GPA	.46	1.39	-.65	-1.38	.54	1.40
Gender	.21	1.16	-.29	-1.15	.20	9.51
Residence length in the USA	.052	.53	-.06	-.39	.01	.05
Number of American friends	.04	1.90	-.03	-1.05	.01	.29
Facebook usage	.22	3.02***	-.03	-.28	.11	1.31
Horizontal collectivism	.24	2.18*	-.03	-.16	.46	3.56**
Extroversion	.40	3.55***	-.51	-3.14***	.002	.02
R ² (%)	.46		.47		.53	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

cultural differences, academic challenges, and psychological and social adjustments. We investigated how Facebook usage, cultural orientation, and personality affect international students' social capital and adjustments.

Regarding SNS usage and social capital outcomes, consistent with the previous SNS research (Ellison et al., 2007; Steinfield et al., 2009; Stefanone et al., 2011), Facebook usage was positively related to international students' online bridging capital. In addition to Facebook usage, horizontal collectivism and extroversion were both correlated to international students' online bridging capital. However, after controlling students' levels of horizontal collectivism and extroversion, Facebook usage was the only factor positively related to online bridging capital. The result indicated that SNSs played an important role in assisting students to expand and manage their online bridging capital.

Results also showed that horizontal collectivism and extroversion were two important factors affecting international students' social capital. They were both positively related to online bridging, offline bonding, and offline bridging capital, but not online bonding capital. Specifically, Facebook usage partially mediated the relationship between extroversion and online bridging capital. This finding supports the proposition that extroverts may benefit more from online communication and SNSs (Ross et al., 2009; Schrock, 2009). As extroverts are already good at developing offline relationships, SNSs such as Facebook enable them to be more likely to move their offline capital to online capital. In

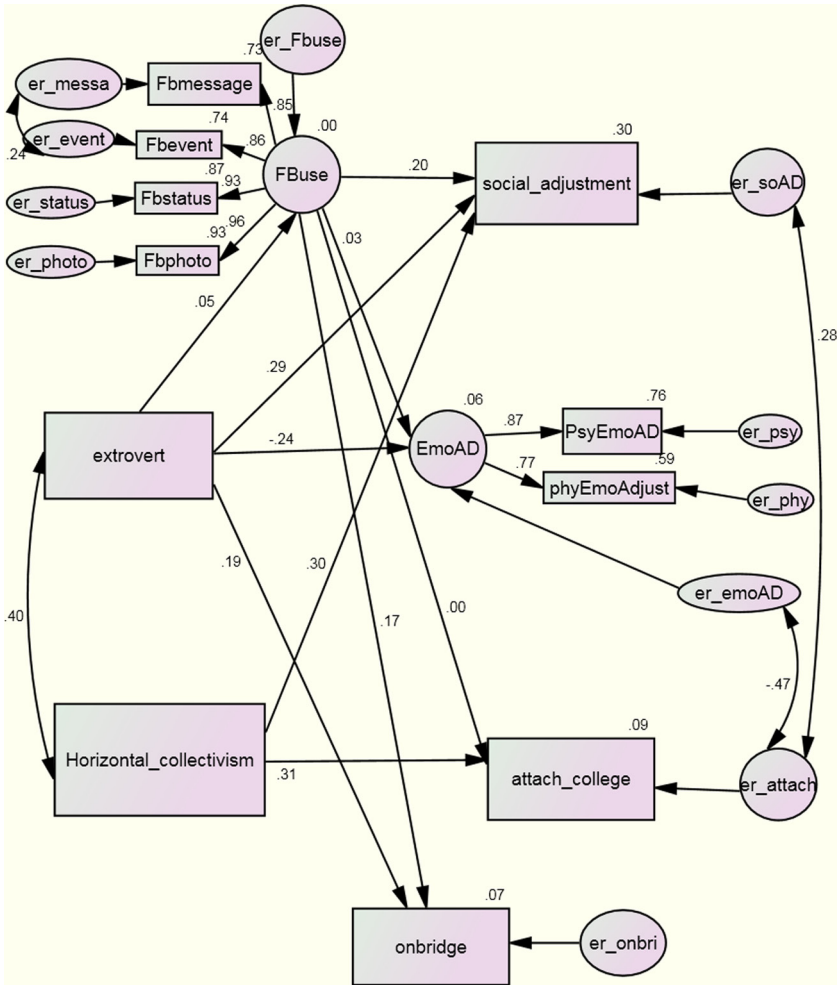


Figure 1. Structural equation model with standardized coefficients.

addition, extroverts would mainly spend time on SNSs to manage their online bridging capital instead of online bonding capital.

Regarding SNS usage and international students' adjustments, results indicated that SNS use, horizontal collectivism, and extroversion were all positively related to social adjustment. While previous literature (Bessièrè et al., 2008; Kraut et al., 2002) has identified that extroversion was an important factor for the relationship between internet usage and users' adjustment, the results of the present study indicated that horizontal collectivism is another important factor. Horizontal collectivism and extroversion both significantly predicted international students' social adjustment. In addition, whereas extroversion was the only significant factor affecting emotional adjustment, horizontal collectivism was the only significant predictor on college attachment. This indicated that

horizontal collectivism could be an intervening or moderating variable in the relationship between SNS usage and adjustments, which may be a competing explanation for the effects of extroversion on online use and adjustments. Future studies of SNS should be interpreted in light of differences in horizontal collectivism between cultures. In addition, the structural equation modeling suggested that these constructs should be taken into consideration when developing the theory regarding SNS usage on adjustments. We acknowledged that only one single study could not establish a theory, but the results shed light on future studies for theory development.

Moreover, the groups that international students interacted with using SNSs affected their social capital and adjustments. Based on the previous literature (Ye, 2006), we further extended the local versus home country interaction into specific social network groups. The more the international students interacted with people from the same country, the more online bridging capital they gained. On the other hand, the more they interacted with American friends using Facebook, the lower their offline bonding and bridging capital were. However, the predicted power of the relationship between interactions with different friend groups and international students' social capital was very small in this study. Future research should continue exploring the relationships between social capital and the types of groups international students interacted with. In addition, more studies are needed to measure the composition of offline social networks of these international students and examine the effect of Facebook usage on both online and offline friend groups.

We also found that the more time international students spent on Facebook interacting with American friends, the better social adjustment the students had. However, contrary to Ye's (2006) finding that students who had more perceived support from the networks in their home countries exhibited better emotional adjustment, our results showed that the time students spent on Facebook interacting with home country friends was only related to better social adjustment and college attachment, but not emotional adjustment. The possible explanation could be that students use SNSs mainly for online bridging, but not online bonding, which is theorized to offer more emotional support.

These findings suggest several implications. First, we should encourage international students to employ SNSs such as Facebook to expand and manage their social network because this could benefit their online bridging capital. In addition, schools could also set up groups on SNSs to facilitate the usage of SNSs among international students. Second, schools could employ SNSs to create an online community for international students to mingle with American students and local people. By exchanging activity photos and messages on SNSs, international students could gain greater social bridging capital and even lead to offline interactions. Interacting with American students can also help international students' social adjustments. Third, as cultural differences and personality traits would influence users' social capital and adjustments, we should provide means to encourage more introverted students and those who identify more with horizontal individualism to SNSs to bridge to different online networks and to have a greater sense of college attachment.

This study focused on how Facebook usage influenced international students' social capitals and adjustments. A recent study (Stefanone et al., 2011) employed an actual behavioral paradigm to examine the enacted instrumental support from bonding and bridging ties on Facebook. Results showed that there was limited support provided through online social

capitals garnered from Facebook. Only 16 percent of contacts responded to the request. About one in four strong ties would provide support, whereas one in ten weak ties responded. Taking the results into consideration, how much actual instrumental support in addition to emotional support do international students receive through mediated online social capitals compared to offline capitals? Are these actual resources related to adjustments and well-beings? Future studies are needed to further examine the relationship.

The current study contributed to the existing literature in several aspects. First, we measured Facebook usage in a different way to capture the complexity of SNS usage by including items regarding different forms of communication. General SNS usage measures have become problematic, since those increasingly include non-communication activities (e.g., playing SNS games without interacting with others, downloading media files). The scale we developed had good reliability, but future research should further test its concurrent validity, predictive validity, and construct validity compared to general SNS usage measurements. In addition, this study measured SNS usage in a fine-grained manner, in which we separated the use with home country friends and American friends. Future research might therefore focus on the problem of identifying what activities on SNSs are central to obtaining meaningful social support or building social capital from those which are not.

Second, unlike previous literature which only studied SNS usage on users' online social capital, this study investigated the effects of SNS usage on both international students' online and offline social capital as well as their adjustments. Although we did not find any relationship between SNS usage and users' offline social capitals, results showed that SNS usage contributed to their online bridging capital and social adjustments. The results provided guidance for future research to further investigate the link between both online and offline social capital and students' adjustments.

Another contribution of the current study is to examine horizontal collectivism and extroversion in the relationship of SNS usage, social capital, and students' adjustments, as distinct from the existing literature (Amichai-Hamburger and Vinitzky, 2010; Ross et al., 2009) that has focused on the influences on users' SNS behavior. Results indicated that these two constructs were closely involved in the association among international students' SNS usage, social capital, and adjustments. Future study should emphasize and explore the roles of horizontal collectivism and extroversion as potential moderating variables on such an association.

There are several limitations of this study. First, the low response rate posed a methodological issue. Web surveys without any incentives generally face this type of potential risk. According to a recent meta-analysis comparing 45 pairs of Web survey and other modes (Manfreda et al., 2008), Web survey had an average of 11 percent lower response rates compared to other modes (e.g., telephone, mail, etc.). Future study could design a better way or provide incentives to motivate students to participate in order to obtain a more representative sample. In addition, although it is acceptable to replace up to 10 percent missing data with the sample mean (Hair et al., 2006), we acknowledge that such imputation may dilute explanatory power of the results. Readers should interpret the results with these limitations in mind.

Second, the cross-sectional data could not indicate any causal relationships. Therefore, we do not know the direction of the relationship between SNS usage and students' adjustments. In addition, we did not measure international students' offline

social network and their time spent with different groups offline. It will be interesting to have a complete map of students' offline and online social networks so that we can explore the relationship between SNS use and offline interaction in their social capital and adjustments. Furthermore, this study measured users' Facebook usage and friends using interval-level measurements instead of ratio-level measurement. Our design purpose was to provide easier measurements because respondents may not be able to recall very detailed information. Future studies employing online survey could ask respondents to log into Facebook to provide accurate information while taking the survey.

Third, measuring cultural difference at the individual level has its own limitations too. As previous literature has indicated, respondents may have different semantic concept of vocabulary in the scales (Schimmack et al., 2005). However, employing individual-level data allows us to exhibit more nuanced variance regarding cultural differences than the fixed cultural score based on their countries. To address this limitation, future research could measure at both levels to provide more levels of analyses to understand the effects of cultural differences. Last but not least, Facebook use was the focus on the present study. Given that some international students also use SNSs from their home countries to manage their interpersonal relationships, future studies could also incorporate measurements regarding other SNSs that are popular in their home countries and the social capital outcomes derived from their home SNSs which could be the conduit for online bonding capital.

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Jih-Hsuan Lin is Assistant Professor in the Department of Communication and Technology at National Chiao Tung University. Her research interests focus on negative and positive effects of digital games, the psychological processes causing such effects, and the role of interactivity in media effect studies. She is also interested in using interactive media for health promotion and education.

Wei Peng is Assistant Professor in the Department of Telecommunication, Information Studies, and Media at Michigan State University. Her primary research interest is to understand the persuasive impacts of interactive technologies, especially digital games. She is interested in using digital games for health promotion, health education, and social change. Her broader research area is the social and psychological influence of communication technology.

Mijung Kim is a doctoral student in the Department of Telecommunication, Information Studies, and Media at Michigan State University. Her research interest is new media effects, especially the influence of new communication technologies on users' information processing, perception, emotions, motivations and behaviors.

Sung Yeun Kim is a doctoral student at the S.I. Newhouse School of Public Communications and a Research Assistant at the Media, Interface, and Network Design (M.I.N.D.) Labs at Syracuse University. Her research interests are new media and technology, computer-mediated communication, human–robot interaction, and the educational effects of video games.

Robert LaRose is Professor in the Department of Telecommunication, Information Studies, and Media at Michigan State University. His research interests are the use and effects of the Internet.