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Transitioning through social media: International students' SNS use, perceived social support, and acculturative stress

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ABSTRACT

Social networking sites (SNSs) are becoming an increasingly important communication tool for international students. Research suggests that it could facilitate the acculturation process. However, the mechanisms through which such facilitation take place are still under-investigated. This study examined the role of perceived social support from home/host country as mediators through which home/host SNSs use were associated with international students' acculturative stress. By surveying international students in a large American university (N = 322), the study found that (1) both perceived social support from home and host country were related to less acculturative stress; (2) SNS use with host national was associated with less acculturative stress through the increased level of social support from host country; (3) SNS use with distant and local conational was related neither to perceived social support from home country nor to acculturative stress. Among the control variables, we also found that (1) non-SNS mediated communication (i.e., email, text messages, and phones calls) with distant conational as well as face-to-face communication with local conational were related to less acculturative stress through the increased level of social support from home country; (2) non-SNS mediated communication with host national was associated with less acculturative stress through the increased level of perceived social support from host country. We discuss how these findings help us understand international students' acculturation experience in the age of digital media.

1. Introduction

Acculturative stress accompanied by moving to another country is associated with serious psychological distress, including anxiety, loneliness, sense of alienation and isolation, and depression (Church, 1982; Oberg, 1960; Ward, Bochner, & Furnham, 2001). Sojourner refers to those who travel abroad for a specific period with the expectation of returning to their home country after the period ends. One of the main group of sojourners is international students (Bochner, 2006). Like immigrants, sojourners also go through an initial transition period during which acculturation takes place. The relationship between immigrant and sojourners' media use and their acculturation has long been studied (Chaffee, Nass, & Yang, 1990; Lee & Tse, 1994; Moon & Park, 2007; Raman & Harwood, 2008; Zhou & Cai, 2002). Specifically, the number of international students has increased steadily in the last decade, reaching a record high of 1.1 million and constituting 5.3% of the higher education population in the United States (Institute of International Education, 2017). The media use of international students has attracted continuous scholarly attention. With the emergence of new communication technologies, such as social networking sites (SNSs) and instant messaging apps, the acculturation experience is qualitatively different from the past. While the physical distance remains, the perceived temporal and spatial barriers in relationship development and maintenance have been vastly reduced (Sandel, 2014). Studies have found that the usage of new technologies, including online ethnic social groups and home/host SNSs, could help international students stay connected with family and friends in the home country and connect with people from the host country (Lin, Peng, Kim, Kim, & LaRose, 2012; Park & Noh, 2018; Park, Song, & Lee, 2014; Rui & Wang, 2015; Ye, 2006a). However, the relationship between SNS use and acculturative stress identified in prior research is not always consistent (Park et al., 2014; Park & Noh, 2018). Therefore, this study sets out to understand this inconsistency by focusing on how such a relationship comes into being (i.e., what is the mechanism through which communication technology influences acculturative stress).

Research on how people cope with stress, especially in transitional times, has found that social support from family members and friends is a very important resource (Cobb, 1976; Cohen & Wills, 1985). The stress buffering model of social support states that social support ameliorates the negative impacts of stress on both mental and physical

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health (Cohen & Herbert, 1996). It is therefore unsurprising that social support is associated with lower acculturative stress (Geeraert & Demoulin, 2013; Han, Kim, Lee, Pistulka, & Kim, 2007; Tartakovsky, 2007; Yeh & Inose, 2003). The rise of computer-mediated communication (CMC) also facilitates the provision of social support via online platforms such as online communities, blogs, and SNSs, for different purposes in different populations (Mo & Coulson, 2012; Sarkadi & Bremberg, 2005; Wright, 2000). In general, people who used Facebook or wrote a blog reported a higher level of social support availability than those who were not participating in these activities. Therefore, we propose that social support could mediate the relationship between SNS use and acculturative stress.

To our best knowledge, only one study examined social support and SNS use in international students (Park & Noh, 2018), and the role of social support as the mediator through which SNS use relates to acculturative stress has seldom been tested. By surveying 322 international students in a large public university in the U.S., this study aims to investigate whether perceived social support from the home country mediates the relationship between home SNS use and acculturative stress, and whether the same mechanism also applies to host SNS use and acculturative stress. In contrast to previous studies that did not discriminate between social support from home and host country, this study measured them separately to answer the questions regarding how SNS use with members of the home/host country contributes to perceived social support from home/host country, and how support from different sources impacts acculturative stress.

2. Literature review

2.1. Acculturation and acculturative stress

Acculturation refers to a process of gradual change of values, attitudes, and behaviors which takes place when people move to another culture and make continuous first-hand intercultural contact (Berry, 2002; Redfield, Linton, & Herskovits, 1936). When going through the process of acculturation and making decisions on how to acculturate, people experience stressors originated from this experience that often result in “anxiety, depression, feeling of marginality and alienation, heightened psychosomatic symptoms, and identity confusion,” which are defined as acculturative stress (Berry & Annis, 1974; Williams & Berry, 1991, p. 634). These difficulties arise across a wide range of aspects, including physical changes in housing, climate, transportation modes, biological changes in dietary habits and diseases susceptibilities, cultural changes in social norms, and psychological changes in personal beliefs and attitudes (Singh, 2011). And these difficulties may contribute to the reduction of individuals' psychological and physical health (Williams & Berry, 1991).

The acculturative stressors faced by international students are (1) language barriers, mainly English proficiency; (2) educational challenges, including different teaching styles, academic stress, and mismatched expectations; (3) sociocultural stressors, including loneliness, isolation, difficulties in making friends, and living away from one's family and friends; (4) discrimination, including sense of inferiority (implicit or explicit), verbal or nonverbal acts by members of the host society; (5) practical stressors, including financial, legal, or emotional problems (Smith & Khawaja, 2011). Past studies found that staying longer in the U.S., speaking better English, being a female, and having a higher level of social support all had negative associations with acculturative stress (Yeh & Inose, 2003; Zhang & Goodson, 2011).

2.2. Perceived social support and acculturative stress

Cobb (1976) defines social support as “information leading the subject to believe that he is cared for and loved; information leading the subject to believe he is esteemed and valued; and information leading the subject to believe that he belongs to a network of communication and mutual obligation” (p. 300). Extensive research has shown that social support influences one's psychological and physical health (Uchino, 2004). The stress buffering model of social support posits that people with a greater level of social support maintain greater health and well-being while enduring stressful life events (Uchino, 2004). It proposes that social support's health benefits are driven by its function in providing buffers against stressful life events and their corresponding damaging effects on one's health and in regulating people's maladaptive behaviors in difficult situations. Social support facilitates coping and offers relief in various forms such as informational, emotional, esteem, and tangible support (Cohen, Underwood, & Gottlieb, 2000).

A distinction needs to be made between perceived and received social support. Perceived social support refers to recipients' perceptions of the availability and adequacy of supportive resources in one's social network, while received social support refers to the quantity and quality of specific supportive interactions one receives (Eagle, Hybels, & Proeschold-Bell, 2018). Previous literature showed that perceived and received social support are correlated (Haber, Cohen, Lucas, & Baltes, 2007), however, perceived social support is found to have a greater and more consistent relationship with stress and mental health outcomes (Eagle et al., 2018; Lindorff, 2000; Prati & Pietrantoni, 2010). Like other populations studied before, international students live far away from their home country's social networks, the mental perception that adequate support will be available to them once they are in need could be powerful enough to reduce the negative impact of stressors (Cohen & Wills, 1985). The current study therefore focuses on perceived social support.

Social support is extremely important in terms of helping international students cope with the stress, offering them advice in difficult situations, and reassuring them of their values. Indeed, many studies have found significant direct effects of perceived social support in relieving immigrants' or international students' acculturative stress and in promoting mental health (Geeraert & Demoulin, 2013; Han et al., 2007; Min, Moon, & Lubben, 2005).

Given that international students mainly operate within their conational network and their network with host nationals (Bochner, McLeod, & Lin, 1977), their perceived social support will also originate from these two networks. However, previous studies on how social support contributes to acculturation have seldom measured the perceived social support from home country and host country separately and simultaneously (Ye, 2006b; Yeh & Inose, 2003), which could be too generalized. As social support is inherently associated with the structure of social relationships (Vaux, 1988), and the availability and functions of international students' host and home social networks differ, it is important to separate perceived social support from these different sources. Social contact with local host has long been recognized as helping international students understand the cultural beliefs and behaviors of the host society, reducing anxiety associated with acculturative experience, thus facilitating the process of acculturation (Searle & Ward, 1990). Contact with home country's family and friends can be useful in terms of providing emotional support and maintaining ethnic identity (Park et al., 2014).

Therefore, the present study argues that home and host country serve as two different sources of social support which independently exert positive effects on acculturative stress.

H1: Perceived social support from host country is negatively related to acculturative stress.

H2: Perceived social support from home country is negatively related to acculturative stress.

2.3. SNSs use and acculturative stress

Accompanying the development of CMC, how international students take advantage of various forms of communication technologies, such as the Internet and email, has been under continuous investigation (Cemalcilar, Falbo, & Stapleton, 2005; Hendrickson & Rosen, 2017;

Park et al., 2014; Ye, 2006b). Some research showed the Internet played a favorable role in supporting sojourners' transition into the new society (Cao & Zhang, 2012; Chen, 2010; Li & Tsai, 2015). For example, having Internet access allows immigrants to find new jobs and strategies to cope with the pressures triggered by resettling into a new environment (Tsai, 2006). Students who spent more time on English-language Internet reported less cultural shock, which is one subscale of acculturative stress, while those who spent more time on the native-language Internet reported more cultural shock (Ye, 2005). A higher proportion of time spent on Singaporean websites was positively correlated with the overall psychological adaptation of Chinese immigrants in Singapore (Chen, 2010). Using the Internet for interacting with local people (i.e., Koreans or other international students in Korea) was a significant predictor of social adjustment for Chinese students studying in Korea (Lee, Lee, & Jang, 2011). Sojourners who are experiencing anxiety and uncertainty in the new environment can also fulfill their needs for informational and emotional support through the use of the Internet (Woldeab, 2013).

The wide adoption of SNSs is the most recent development in college students'—including international students'—media consumption patterns (Lim & Pham, 2016). The relationship between SNS use and the well-being of college students has become a major topic in social media research, and no conclusive results have been drawn. For example, the number of Facebook friends was positively associated with reduced stress, subjective well-being, and life satisfaction (Kim & Lee, 2010; Manago, Taylor, & Greenfield, 2012; Nabi, Prestin, & So, 2013), and "social" forms of SNS use, such as status updates, were positively related to users' subjective well-being (Wang, Jackson, Gaskin, & Wang, 2014). On the other hand, Facebook envy has been found to mediate the negative effects of the surveillance use of Facebook, which refers to passively consuming friend's social news, on depression, and rumination also mediated the negative effects of Facebook status update on subjective well-being (Locatelli, Kluwe, & Bryant, 2012; Tandoc, Ferrucci, & Duffy, 2015).

For international students, SNSs help students maintain existing social ties in the home country, build new ties in the host country, provide access to resources from both sides, and facilitate cross-cultural adaption (Lin et al., 2012). When it comes to SNS use for international students, Facebook is not the only platform. Only 36% of international students reported Facebook as their primary SNS in one survey in the U.S. (Lin et al., 2012). Another study conducted in Australia also showed that respondents from China used Renren, a Chinese equivalent of Facebook before it lost popularity, for information seeking at the same level as Facebook (Saw, Abbott, Donaghey, & McDonald, 2013). Arguably, there needs to be a distinction between home and host SNS use when investigating how international students' usage of SNS promotes the perceptions of social support. Regarding host SNS use, Park et al. (2014) found that Korean and Chinese international students in the U.S. who *only* used Facebook displayed the lowest degree of acculturative stress and the highest degree of psychological well-being. Direct communication with local host nationals using SNSs was positively linked to uncertainty reduction, thus facilitated cross-cultural adaption (Rui & Wang, 2015). Therefore, we hypothesize that:

H3: Host SNS use is negatively associated with acculturative stress.

However, there are inconsistent findings regarding the effect of home SNS use on adaption. Park et al. (2014) found that usage of home SNS was related to higher acculturative stress. Rui and Wang (2015) discovered that communication with people from the home country who were currently living in the U.S. (or local conational) on SNS was negatively linked to uncertainty reduction. One recent study found that time spent on home SNS was not related to acculturative stress among international students who are studying in Korea (Park & Noh, 2018).

One possible explanation for such inconsistency may be that previous research seldom differentiates between international students' interactions with two groups of people from their home country, (i.e., people from home country who are currently living in the home country, termed distant conational, and local conational). Interactions with these two groups may have potentially different implications on acculturation. For example, Lim and Pham (2016) found that the communication frequency and discussion topics were different for Indonesian and Vietnamese students in Singapore when they were communicating with their distant conationals and local conationals. Therefore, to resolve the inconsistencies in previous findings and to obtain a more nuanced view of how home SNS use influences acculturative stress when there is no clear evidence of the directions of the associations from prior literature, this study asks:

RQ: How does home SNS use with (a) distant conational and (b) local conational associate with acculturative stress?

2.4. SNSs and perceived social support

The proliferation of computers and the narrowing of first-level digital divide in physical access to information and communication technologies (ICT) (Campos-Castillo, 2015) have made online social support readily accessible. Specifically, various features of SNSs (e.g., status updates, wall posts, inbox messages, chat) are helpful for individuals looking for support and for engaging in generalized reciprocity by responding to others' requests (Valenzuela, Halpern, & Katz, 2014). The number of publications on SNSs and social support also increased significantly from 2004 to 2015 (Meng, Martinez, Holmstrom, Chung, & Cox, 2017). With the rising importance of SNS in people's lives, ample research has reported the positive role of SNS in providing social support to different people in different situations (Liu & Larose, 2008; Mo & Coulson, 2012; Sarkadi & Bremberg, 2005; Wright, 2000). SNS users consistently reported higher levels of online social support than nonusers across all six waves in a longitudinal study (Utz & Breuer, 2017), and using Facebook was positively related to social support (Chung, Yang, & Chen, 2014; Li, Chen, & Popiel, 2015; Zhang, 2017).

International students are prime candidates for taking advantage of online social support, as they are geographically distant from their home country networks while dealing with various acculturative stressors. The transitions associated with leaving one's home country to study in the host country involve a loss of social support resources that are also related to increased stress and decreased well-being (Mikal, Rice, Abeyta, & DeVilbiss, 2013), and SNS use may help combat such losses by facilitating communication with both old and new social contacts. The social compensation hypothesis posits that the Internet benefits those who are traditionally at a disadvantage in support availability in that it provides them with means to reinforce existing ties with close others and provide access to weak ties (Rains & Tsetsi, 2017). It is argued that computer-mediated social support prevails over face-to-face support when individuals and their networks are physically isolated, or when individual's old networks may be ineffective in providing appropriate support during transitions (Mikal et al., 2013). Benefits of computer-mediated social support include its ability to "cocope" with others, to offer advice to others, to maintain existing relationships, and to build new communities (Mikal et al., 2013). Furthermore, one study that looked at CMC with distant friends among college freshmen found that it predicted lower levels of emotional distress when the face-to-face friendship quality was low, supporting the social compensation hypothesis (Ranney & Troop-Gordon, 2012). Students who used Facebook for class collaborations also reported more social support, which is related to better social adjustment to college (Gray, Vitak, Easton, & Ellison, 2013).

For the international student population, qualitative studies also reported that host SNS could serve as an aid for cultural adaptation through various features such as informal communication and private groups for information seeking, emotional support, and community building (Cao & Zhang, 2012; Magro, Ryan, Sharp, & Ryan, 2009). One study also found that the intensity of using home SNS was positively related to perceived social support, though the time spent on home and

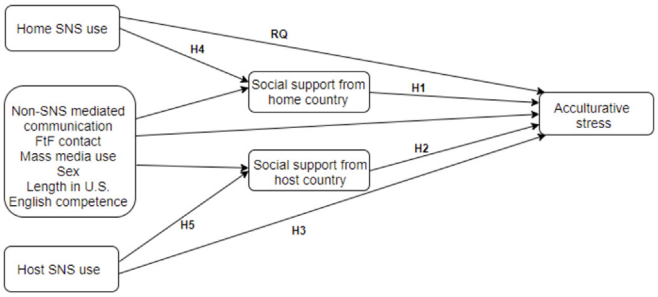

Fig. 1. Diagram for the tested model.

host SNS was unrelated to perceived social support (Park & Noh, 2018).

Given the evidence listed above, we hypothesize that:

H4: SNS use with host nationals is positively associated with perceived social support from the host country.

In addition, international students' usage of CMC tools to communicate with home culture was found to predict perceived social support from home country (Cemalcilar et al., 2005). Therefore, we also hypothesize that:

H5: SNS use with (a) distant conational and (b) local conational is positively associated with perceived social support from home country.

Based on the evidence from past research, other important factors influencing acculturative stress were included as control variables, including participants' sex, English proficiency, length of residence in the U.S., face to face (FtF) contact with local conationals and host nationals (Zhang & Goodson, 2011), usage of home/host country's mass media (Lee & Tse, 1994; Moon & Park, 2007; Raman & Harwood, 2008), and non-SNS mediated communication with distant conationals, local conationals, and host nationals (Park et al., 2014; Park & Noh, 2018). A diagram summarizing the proposed hypotheses and research question is shown in Fig. 1.

3. Method

3.1. Sampling and procedure

An online survey was conducted in a large Midwestern university that is ranked among the top 10 universities in the number of international students in the U.S. Data was collected in the academic year 2017–2018. Two methods were used to recruit participants who were at least 18 years old. The first method was an email invitation (followed by a reminder email) sent by the Registrar's office to international first-year graduate and undergraduate students. The second method used an online student subject pool that screened for international student participants. Participants from the email invitations were entered into a raffle to win a pair of $99 Beats headphones or one of 18 $25 Amazon gift cards. Participants from the student subject pool were granted course credits. All procedures were approved by the Institutional Review Board. A total of 372 responses were collected, among which 322 responses passed more than half of the attention checks.[1] The average age of the final sample was about 23 years old (M = 23.19, SD = 3.66). About sixty percent of the sample was female. Their average time of residence in the U.S. was 31 months (M = 30.84, SD = 28.32). Participants came from 47 countries, with Chinese students being the largest group (55.59%), followed by students from India (6.21%), South Korea (6.21%), Germany (3.11%), and Taiwan (3.11%).

3.2. Measurements

Acculturative stress was measured by a 36-item validated scale developed by Sandhu and Asrabadi (1994). Participants used a 7-point Likert scale to assess various psychological states that were relevant for the intercultural transitional experience, such as "Homesickness for my country bothers me," "I feel uncomfortable to adjust to new foods and/or to new eating habits," and "I feel sad leaving my relatives behind." An overall score for acculturative stress was created by summing and averaging individual scores across all 36 items (Cronbach's α = 0.95). Higher scores indicated stronger agreement with greater stress.

Home and host SNS use. Participants were first asked to select two of their most frequently used SNSs from a list of 10 most popular SNSs worldwide, including Facebook, WhatsApp, Wechat, Tencent QQ, Instagram, Snapchat, Skype, Sina Weibo, Kakaotalk, and Twitter.[2] They could also fill out names of other SNS if they did not find their most frequently used SNS on the list, or they could choose one SNS if they only used one frequently. For each identified SNS, they were asked how many minutes they spent on it in a typical weekday/in a typical weekend day. Then, participants were asked to assign percentages to the groups of people they were interacting with on those SNSs. The four groups included *distant conational*, *local conational*, *host national*, and *non-conational international students*.[3] Percentages for engaging with these four groups on a certain SNS must be totaled to 100. Daily SNS use was calculated by multiplying the minutes spent on an average weekday by 5 and the minutes spent on an average weekend day by 2, divided by 7, and was later converted from minutes to hours. Participants' SNSs use with the four different groups were calculated by multiplying their daily SNS use with the percentages participants assigned for interacting with each of the four groups. Scores of each of the two most frequently used SNSs were summed to form a total score of SNSs use with each of the four groups. Scores of two groups—*distant conational* and *local conational*— were used as measurements for home SNS use. Participants' time spent with *host national* were used as host SNS use.

Social support from home/host country[4] was measured separately by administering Cutrona and Russell (1987)'s social provision scale. This scale consists of six subscales, including attachment, reliable alliance, guidance, social integration, reassurance of worth, and nurturance. Four subscales (attachment, social integration, reliable alliance, and guidance) were used for this study. Attachment subscale measures the degree of emotional closeness one achieves with others. One sample item for the attachment subscale is "I feel a strong emotional bond with at least one other person in this group." Social integration measures the comfort, security, and pleasure one can derive from socializing with others, most importantly, friends. One sample item for the social integration subscale is "There are people in this group who enjoy the same social activities I do." Reliable alliance measures the assurance one has about being able to depend on others when in need of tangible assistance. One sample item for the reliable alliance subscale is "There are people in this group who I can count on in an emergency." Like reliable alliance, guidance measures the degree to which one can obtain information and advice from others when in a problem-solving context. One sample item for the guidance subscale is "There is someone in this group I could talk to about important decisions in my life." Reassurance of worth measures the degree to which other people recognize an

[1] Participants were instructed to choose preassigned answers for six questions that were distributed evenly across the survey. Only those who answered at least three questions correctly were included in the analysis.

[2] We measured two SNSs given that international students may have different primary SNSs for contacting people in the home and host country.

[3] Participants reported only 6% of their time spent on SNSs was with non-conational international students. This data was not used in the final analysis due to its limited relevance to the RHs and RQs.

[4] We did not discriminate between perceived social support from distant conational and local conational for the sake of keeping the length of the survey reasonable and not overburdening the respondents. We discussed the implications and limitations of this choice in the discussion section.

individuals' competence and skills. One sample item is "I have relationships where my competence and skill are recognized." Nurturance measures the degree to which other people rely on the individual for their well-being, and one sample item is "There are people who depend on me for help." We did not include the reassurance of worth and nurturance subscales since most multidimensional social support scales focus on emotional, informational, instrumental, and companionship support (Cohen et al., 2000), which roughly corresponds to the attachment, reliable alliance, guidance, and social integration subscales. Each of the subscales consists of four items measured on a 7-point Likert scale (1 = strongly agree, 7 = strongly disagree). When measuring perceived social support from home country, participants were asked "Please think about your current relationships with people from your home country and rate your level of agreement with the statements below." Additionally, when measuring perceived social support from host country, participants were asked to think about their current relationships with host nationals. Items were reverse coded when necessary so that higher values indicated higher perceived support. The 16 items were averaged to generate a score of perceived social support.[5] Cronbach's α for the scale when measuring perceived support from home and host country was 0.94 and 0.95, respectively.

For *face-to-face communication with local conationals and host nationals*, participants rated on a 7-point scale (1 = never, 7 = multiple times a day) the frequency of face-to-face social interactions with these two groups.

Non-SNS mediated communication with distant conationals and local conationals were measured by asking participants to rate their frequency of engaging in interpersonal communication via email, text messages, and phones calls with distant conational and local conational on a 7-point scale (1 = never, 7 = multiple times a day). *Non-SNS mediated communication with host national* was measured by asking participants to rate their frequency of engaging in interpersonal communication via email, text messages, and phones calls with host nationals on the same frequency scale (Park et al., 2014).

Home and host mass media usage were measured by asking participants about their frequency of "using home country mass media, including reading newspapers and watching TV programs both online and offline," and "using American mass media, including reading newspapers and watching TV programs both online and offline," on a 7-point scale (1 = never, 7 = multiple times a day).

For *English competence*, participants self-rated their fluency in writing, speaking, reading and listening on a 5-point scale (1 = excellent, 5 = terrible). Items were reverse coded so that higher value means better language ability. Scores of four items were averaged to indicate one's English ability (Cronbach's α = 0.84).

Length of residence in the U.S. was measured by how long they have lived in the U.S. in months. *Sex* was measured (female = 0, male = 1). *Data source* was also controlled with 1 indicating participants from the online student participant pool and 0 indicating participants recruited from emails sent by the Registrar's office.

3.3. Data analysis

First, descriptive statistics and correlation analyses were presented. Second, path analysis was used to obtain the direct and indirect effects of home/host SNSs use on acculturative stress through perceived social support from home/host country. Several well-established goodness-of-fit indices were used to assess the model fit, including the Chi-square statistics, the root mean square error of approximation (RMSEA), CFI, and SRMR. A good model is usually suggested to have a non-significant Chi-square statistic, an RMSEA value of less than 0.05, a CFI greater than 0.90, and a SRMR value less than 0.05 (Browne & Cudeck, 1992; Hox & Bechger, 1998; Hu & Bentler, 1998; Hu & Bentler, 1999), though using the significance of Chi-square statistic as an indicator of model fit is less useful in large samples (Bentler & Bonett, 1980). We constructed bias-corrected bootstrap 95% confidence intervals around the product coefficient of the indirect effect of home/host SNS use (as well as non-SNS mediated communication, face-to-face contact, and mass media use) via social support from home/host countries on acculturative stress using a nonparametric, bias-corrected bootstrap method recommended by Fritz and Mackinnon (2007), and MacKinnon, Lockwood, and Williams (2004) with 5000 resamples. The path model depicted in Fig. 1 was specified in Mplus 7. Given that 11 out 311 individuals did not complete the whole questionnaire, full information maximum likelihood estimation was used to impute missing data (Enders & Bandalos, 2001).

4. Results

Of the 322 participants, 221 were undergraduate students (68%), 80 were graduate students (25%), 13 were non-degree students (4%), and 8 students had missing data (3%). One hundred and eighty-four were female (57%), 126 were male (39%), and 12 students had missing data for sex (4%). Among the 10 listed SNSs, Wechat (56%), Facebook (38%), and Instagram (28%) were identified by the greatest number of participants as their top two most frequently used SNSs, while Twitter (3%), Skype (2%), and Snapchat (8%) were indicated by the least number of participants as their top two most frequently used SNSs. Line, YouTube, and LinkedIn were also identified by participants who did not find their two most frequently used SNSs on the list. Participants spent an average of 1.63 h per day (SD = 1.67) with distant conational, 1.22 h per day (SD = 1.64) with local conational, and 0.27 h per day (SD = 0.59) with host national. Means, standard deviations, and correlations of all relevant variables are presented in Table 1.

4.1. Hypothesis testing

Our hypotheses were tested in a path model with social support from home/host country as mediators. The model fit the data well based on several goodness-of-fit statistics ($\chi^2(10) = 22.43$, $p = .01$, RMSEA = 0.06, CFI = 0.95, SRMR = 0.02). Results from the model are presented in Table 2 and Fig. 2.

International students who perceived more social support from host country reported less acculturative stress ($\beta = -0.14$, $p < .05$), supporting H1. Perceived social support from home country was also found to be associated with less acculturative stress ($\beta = -0.21$, $p < .001$), supporting H2.

SNS use with host national was not directly related to acculturative stress ($\beta = -0.01$, $p = .92$), offering no support for H3. For RQ regarding how SNS use with distant conational and local conational relate to acculturative stress, both SNS use with distant conational ($\beta = 0.05$, $p = .06$) and SNS use with local conational were not related to acculturative stress ($\beta = -0.05$, $p = .06$).

International students who spent more time on SNS use with host national perceived a higher level of support from host country ($\beta = 0.23$, $p < .05$), supporting H4. The time international students spent on SNS with distant conational ($\beta = -0.01$, $p = .70$), as well as with local conational ($\beta = -0.04$, $p = .30$) were both unrelated to perceived social support from home country. Therefore, H5 was not supported.

Among the indirect effects, the 95% bootstrap confidence interval for the indirect effect of SNS use with host national on acculturative stress (effect estimate = −0.03, 95% confidence interval [-0.084, −0.005]), based on 5000 bootstrap samples, was entirely below zero. Similarly, the 95% bootstrap confidence interval for the indirect effect of non-SNS mediated communication with host national on acculturative stress (effect estimate = −0.03, 95% confidence interval [-0.06, −0.009]) was also entirely below zero. These results indicated that SNS

[5] This study focuses on the overall perceived social support, so we did not use scores from each subscale.

Table 1
Zero-order correlations means and standard deviations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Acculturative stress	1														
2. SNS use with distant conational	.10+	1													
3. SNS use with local conational	.03	.34***	1												
4. SNS use with host national	-.06	.00	.10+	1											
5. Social support from home	-.30***	-.01	-.06	-.05	1										
6. Social support from host	-.27***	-.14*	-.10+	.24***	.24***	1									
7. Non-SNS mediated communication with distant conational	-.16**	.20***	.04	-.07	.34***	.07	1								
8. Non-SNS mediated communication with local conational	.04	.15**	.27***	-.06	.20***	.01	.39***	1							
9. Non-SNS mediated communication with host national	-.13*	-.02	-.21***	.27***	.16**	.44***	.22***	.07	1						
1. Face-to-face contact with host national	-.20***	-.10+	-.18**	.15**	.32***	.34***	.32***	.08	.52***	1					
11. Face-to-face contact with local conational	.08	.10+	.16*	-.07	.21***	-.08	.23***	.62***	-.11*	.05	1				
12. Home mass media use	-.05	.03	.14*	-.15**	.16**	-.11*	.31***	.40***	-.045	.03	.38***	1			
13. Host mass media use	-.17**	-.02	-.03	.15**	.11*	.16**	.24***	.20***	.24***	.25***	.12*	.36***	1		
14. English competence	-.32***	-.10+	-.18**	.21***	.23***	.32***	.15**	-.13*	.31***	.34***	-.19***	-.09	.22***	1	
15. Length in the U.S.	.12*	-.07	.10+	.02	-.03	.11+	-.13*	.14*	-.00	-.09	.11*	.08	.04	-.07	1
M	3.43	1.63	1.23	.26	5.43	4.40	5.40	5.15	4.30	4.98	5.18	5.10	4.86	3.77	2.58
SD	.96	1.67	1.65	.52	1.06	1.18	1.45	1.80	1.61	1.67	1.87	1.76	1.55	.72	2.36

Note. + $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$.

use and non-SNS mediated communication with host national were associated with a higher level of perceived social support from host country, which in turn, was negatively associated with acculturative stress.

Since SNS use with both distant and local conational was unrelated to perceived social support from home country, there were no significant indirect effects of home SNS use on acculturative stress via perceived social support from home country. Nevertheless, we found that the indirect effect of non-SNS mediated communication with distant conational (effect estimate = −0.03, 95% confidence interval [-0.069, −0.013]) and the indirect effect of face-to-face communication with local conational (effect estimate = −0.02, 95% confidence interval [-0.048, −0.007]) via the perceived social support from home country on acculturative stress were both significant. These results indicated that non-SNS mediated communication with distant conational and face-to-face communication with local conational were associated with a higher level of perceived social support from home country and, in turn, less acculturative stress.

As for the other control variables, home mass media ($\beta = -0.02$, $p > .05$) and host mass media ($\beta = -0.04$, $p > .05$) use were not associated with acculturative stress. English proficiency ($\beta = -0.25$, $p < .01$) was negatively associated with acculturative stress, and length of stay in the U.S. ($\beta = 0.05$, $p > .05$) did not associate with acculturative stress.

5. Discussion

Drawing insights from a long line of research on acculturation of immigrants, the present study investigated how using SNSs influenced international students' acculturative stress through perceived social support. Consistent with previous research, perceived social support from both home and host country were beneficial for reducing international students' acculturative stress. Home SNS use with distant and local conational were unrelated to acculturative stress and perceived social support from home country. The relationship between host SNS use and acculturative stress was fully mediated by perceived social support from host country. This study advances this area of research by identifying the different patterns of effects that home and host SNS use have on acculturative stress, establishing the mediational role of perceived social support between host SNS use and acculturative stress, and offering another piece of evidence regarding international students' acculturation experiences in the era of social media.

5.1. Perceived social support and acculturative stress

Consistent with previous studies on immigrants (Geeraert & Demoulin, 2013; Han et al., 2007; Li et al., 2014; Min et al., 2005), perceived social support from both home and host countries was shown to be associated with decreased acculturative stress for international students. Based on the stress buffering model, social support may be related to international students' psychological adjustments through changing their cognitive appraisal of the stressors (Lazarus & Folkman, 1984). How social support could facilitate individuals' more favorable evaluation of difficult situations is suggested by Cohen et al. (2000). First, the belief that friends and family members can help when needed will reduce the potential risks and harms posed by the new social, physical, and political environment. Such support will bolster the individual's perceived ability to cope with various challenges. Additionally, perceived availability of support will dampen the physiological responses to stressors (Uchino, Cacioppo, & Kiecolt-Glaser, 1996), which also prevents further maladaptive coping behaviors, such as smoking, binge eating, and inactivity (Lyzwinski, Caffery, Bambling, & Edirippulige, 2018; Ng & Jeffery, 2003).

Regardless of whether the support is from home or host country, it is both associated with decreased acculturative stress, which is consistent with a previous study that found supportive relationships with both heritage and host culture aid successful adaptation (Kealey, 1989). For international students, since they may return to their home country after graduation, social support from the home country is just as important as from the host country. By comparing the size of the path coefficients, we did find that perceived social support from the home country had a stronger association with acculturative stress than perceived social support from the host country. It may be particularly reassuring for international students to know that their family and friends in the home country can provide necessary resources, such as emotional, informational, and esteem support, to them even when they have temporarily migrated to the U.S.

5.2. Communication with home country, social support, and acculturative stress

We found that only non-SNS mediated communication with distant conational and face-to-face contact with local conational were positively related to perceived social support from home country, which in turn, was associated with lower acculturative stress. We argue that the amount of social support one obtains from different media depends on

Table 2
Path coefficients for effects of communication channels on acculturative stress via social support from home/host country.

Unstandardized parameters	Estimate	SE	*p*
Direct effects			
SNS use with distant conational→AS	.05	.03	.06+
SNS use with local conational→AS	-.05	.03	.06+
SNS use with host national→AS	-.01	.08	.92
Non-SNS mediated communication with distant conational→AS	-.05	.05	.26
Non-SNS mediated communication with local conational→AS	.02	.04	.60
Non-SNS mediated communication with host national→AS	.04	.04	.31
Face-to-face contact with local conational→AS	.05	.04	.13
Face-to-face contact with host national→AS	-.002	.04	.96
Home mass media use→AS	-.02	.04	.56
Host mass media use→AS	-.04	.04	.24
English competence→AS	-.25	.08	.002**
Length in the U.S.→AS	.05	.03	.05+
Sex (reference = female)→AS	-.17	.11	.13
Data source (reference = Registrar's office)→AS	-.05	.13	.71
Indirect Effects			
SNS use with distant conational→SS(home)	-.01	.03	.71
SNS use with local conational→SS(home)	-.04	.04	.29
SNS use with host national→SS(host)	.23	.10	.02*
Non-SNS mediated communication with distant conational→SS(home)	.16	.05	.001**
Non-SNS mediated communication with local conational→SS(home)	-.005	.04	.90
Non-SNS mediated communication with host national→SS(host)	.21	.05	.000***
Face-to-face contact with local conational→SS(home)	.11	.04	.004**
Face-to-face contact with host national→SS(host)	.07	.04	.13
Home mass media use→SS(home)	.04	.04	.29
Host mass media use→SS(host)	.02	.04	.61
English competence→SS(home)	.32	.08	.000***
English competence→SS(host)	.28	.10	.002**
Length in the U.S.→ SS(home)	.02	.03	.55
Length in the U.S.→ SS(host)	.07	.03	.02*
Sex (reference = female)→ SS(home)	-.39	.12	.001**
Sex (reference = female)→ SS(host)	-.06	.11	.60
Data source (reference = Registrar's office)→ SS(home)	-.21	.13	.11
Data source (reference = Registrar's office)→ SS(host)	.03	.14	.82
SS(home)→AS	-.21	.06	.000***
SS(host)→AS	-.14	.05	.007**
Covariance parameters			
SS(home) ↔ SS(host)	.17	.06	.002**

Note. + $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$. AS = acculturative stress. SS (home) = perceived social support from home country. SS(host) = perceived social support from host country. Covariances of the predictors omitted due to limited space.

the specific social contacts that one engages in through these communication channels who also have the willingness and ability to provide supportive resources. And in explaining findings on communication with home country, we first refer to literature on how people use different communication channels to maintain their social relationships and then discuss the different associations of SNS, non-SNS mediated communication, and face-to-face with perceived social support from home country.

A meta-analysis found that Internet-dependent media, such as SNS, instant messaging, are used to maintain less intimate ties, while Internet independent media, such as phone calls and text messages, are used to communicate with close others (Liu & Yang, 2016). For example, interactions on Facebook was perceived as more "casual and superficial," while cell phones, including texts and calls, were reserved for intimate and personal conversations with strong ties (Yang, Brown, & Braun, 2014). Face-to-face and landline communication were only used for communicating with strong ties (Wang, Chua, & Stefanone, 2015).

Previous findings on how home SNS use relates to stress are

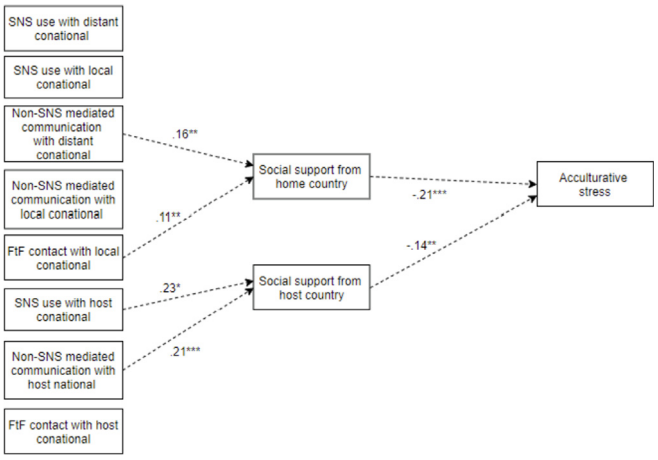

Fig. 2. Path coefficients for the effects of communication channels via social support from home/host country on acculturative stress. *Note.* +$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$. Pathways from home/host mass media use, sex, length in the U.S., and English competence to home/host social support and acculturative stress are omitted from the figure. Non-significant pathways are omitted. All lines indicate significant effects, with dashed lines indicating indirect effects pathways. Covariances are omitted from the figure for ease of interpretation.

inconsistent (Park & Noh, 2018; Park et al., 2014), so are the findings regarding the relationships between interacting with conational and life satisfaction, uncertainty, and anxiety during cross-cultural adaptation (Kim, 2001; Ye, 2006b). Despite categorizing the specific types of conationals that students are interacting with on SNSs, we did not find any significant effects of SNS use with local and distant conational on acculturative stress, or on perceived social support from home country. We found that SNS use fails to compete with face-to-face contact in terms of garnering support from local conationals. This is understandable given that SNS was used to support weak tie relationships, and face-to-face communication facilitates the development and maintenance of strong ties, which is more powerful in providing social support (Wellman & Wortley, 1990). Face-to-face is long held as the "gold-standard" for maintaining intimate relationships (Duck & Pittman, 1994). More recently, studies have identified that face-to-face was related to communication with strong ties that are known to boost well-being and this type of communication is also associated with lower level of loneliness (Wang et al., 2015; Wohn, Peng, & Zytko, 2017).

Furthermore, we also found that SNS use lost to non-SNS mediated communication when it comes to communicating social support with distant conationals. Confined by geographic distance, SNSs' role as a breeding ground for further relationship development (Yang et al., 2014) may not be as salient for international students, especially with certain types of SNS usage such as passive consumption. In contrast, since non-SNS mediated communication is usually conducted on a one-to-one basis and requires mutuality, international students may maintain a strong tie network on such platforms, as suggested by Yang et al. (2014)'s finding that texts and phone calls are used for communicating with close others. With the temporal and geographic differences, non-SNS mediated communication may have come as the second-best choice to face-to-face communication when international students need to directly connect with their close friends and family members that also provide more supportive resources (Lin, 2001; Wellman & Wortley, 1990).

5.3. Communication with host country, social support, and acculturative stress

We found that SNS use and non-SNS mediated communication with host conational were positively related to perceived social support from

host country, which in turn, also associated with lower acculturative stress. Given that previous studies have suggested that international students' social ties in the host country are most likely to be weak ties due to lack of communication at a deeper and more personal level (Gareis, 2012; Trice, 2004), it is reasonable to argue that the average strength of relationships sojourners maintain within their host country communication network may be weaker than with their home country network. In explaining findings on communication with host country, we first outline the usefulness of weak ties for providing social support, and then discuss how SNS use and non-SNS mediated communication with host nationals may be related to perceived social support from host country.

Plenty of literature has argued for the importance of weak ties in providing social support, especially in situations when close family members and friends lack experience or have insufficient information, when individuals do not want to appear vulnerable, or when individuals feel they are unable to reciprocate certain supportive actions that are dictated by role obligations (Wright & Miller, 2010; Wright, Rains, & Banas, 2010). Individuals also have access to more diverse information and opinions. Their number of reference groups for social comparisons also increased due to their weak-tie networks (Wright & Miller, 2010; Wright et al., 2010). When it comes to the subject of living in America, weak ties from the host country have more experience, knowledge, and skills than most of the strong ties from the home country, thus they can provide valuable assistance in various aspects of international students' life. Early acculturation studies also emphasized how interpersonal contact with host national can help reduce cultural stress (Olaniran, 1993), and make successful adaptations (Surdam & Collins, 1984).

Perceived social support serves as the buffering mechanism through which SNS use with host national is associated with lower acculturative stress. Time spent on host SNSs is reflective of the quantity of social interactions between international students and the host society, and a previous study has found that direct communication using SNS is associated with less uncertainty and better cross-cultural adaptation (Rui & Wang, 2015). Using SNSs may activate latent ties with people from the host society, as well as provide access to more embedded latent ties due to the social functions, such as friend and event suggestions, associated with SNSs (Hendrickson & Rosen, 2017). For international students, using host SNS involves building an online profile that contains personal information to make themselves known to host nationals and connecting with host nationals to develop a support network. Further, international students gain knowledge of new contacts' life that reduces the sense of unfamiliarity and interact with host nationals via features such as likes, comments, and mentions that may foster mutual understandings. Such increased feelings of closeness through interactive communication on SNS may directly cultivate perceived social support. Due to the asynchronous nature of SNS for impression management (Picone, 2015), it may be particularly helpful for international students to start the social interaction with host nationals on SNS first. Information revealed on SNSs serves as social lubricants and provides common ground for future face-to-face interactions and communication via other media (Gray et al., 2013).

Like host SNS use, non-SNS mediated communication with host nationals is also associated with a lower level of acculturative stress via perceived social support from host country. As proposed by the hyperpersonal model, CMC prevails over face-to-face interaction by allowing the sender to strategically construct messages that optimize self-representation (Walther, 1996). In this case, both SNS and non-SNS mediated communication (e.g., text messages and emails), do afford such asynchrony. Optimized self-representation may lead participants to feel satisfied with the processes and results of the social interactions with host country friends; therefore they are likely to perceive higher social support when using these media. Hindered by language and cultural barriers, international students may have difficulties engaging in quality and in-depth conversations with host country friends, which may have prevented them from perceiving adequate social support from their host nationals.

Even though students rarely use one channel of communication with either home or host country friends (Lim & Pham, 2016), our understandings of the relationships outlined above can be useful for thinking about which communication channel has a stronger association with perceived social support from home/host country, which serves as important protective mechanisms for international students' mental health and psychological well-being.

Regarding the control variables, neither home nor host mass media use relates to acculturative stress, which is consistent with Park et al. (2014) and Park and Noh (2018), who attributed mass media's null effect to students' reduced reliance on mass media for information-seeking and entertainment in the new media era. Additionally, those with higher English competence and those that have stayed in the U.S. for a longer time perceive a higher level of social support from the host country. English competence is also directly related to lower level of acculturative stress, which is consistent with previous research (Yeh & Inose, 2003). English competence represents sojourner's linguistic ability to understand their surroundings, interact with others, and negotiate their daily encounters. Students with fewer language barriers may be better equipped to conquer the transitional difficulties and acculturate to the host society with relative ease.

International students have constituted a growing population on American campuses in recent years. In the meantime, acculturative stressors associated with studying in the U.S. can be demanding for their coping skills. Future intervention programs that are designed to facilitate international students' transitioning to a new environment could offer them more opportunities to cultivate local social ties and provide them with more access to social support. It may be crucial to improve international students' media literacy, so they could form more efficient and effective habits of media use when it comes to seeking support from both home and host country.

5.4. Limitations

Several limitations need to be acknowledged. First, since it is a convenience sample, results are not generalizable. However, this problem seems to be inevitable when researching on a particular population that is also hard to reach, such as international students. Second, all measures used in this study are self-reported, which have some pitfalls that are well-documented (Rosenman, Tennekoon, & Hill, 2011). In measuring time spent on home and host SNSs, participants' global estimates may also suffer from systematic recall bias (Hampton, 2017). With continuous media, such as SNSs, the problems associated with self-report could be aggravated since it is hard to keep track of the exact amount of time spent on one site or another due to multitasking. When answering questions about acculturative stress, some international students may not be willing to give honest answers about their psychological states to an online survey. Third, all international students were treated as one group in this study, without considering the variations among them. Fourth, since data collected for this study were cross-sectional, no causal inferences can be made. Future research should employ a longitudinal design to determine the directions of the effects of home/host SNS use, social support from the home/host country, and acculturative stress. Fifth, due to the main interest of this study being whether or not overall perceived social support impacts acculturative stress, we did not further explore how various types of support measured by the social provisions scale (Cutrona and Russell, 1987) may have influenced acculturative stress differently. Future study could investigate the relationships among social media use, different types of social support, and acculturative stress. Additionally, social support from distant conational and local conational were not differentiated in the current study. To reduce cognitive fatigue by keeping the survey at a reasonable length, social support from local and distant conational were not measured separately. Aggregating two

sources of social support from two different home country groups may have prevented us from learning about the more specific associations between communication with distant/local conational and social support from distant/local conational. Future research could explore how different types of social support from these two different sources contribute to acculturative stress. Sixth, although the focus of the present study is to examine the contribution of social support from home and host country for the alleviation of acculturative stress because these two groups are the primary groups international students interact with, international students may also perceive social support from non-conational international students. Given that we only have 322 participants, we decided to exclude variables related to non-conational international students in our path model and focused on the most important predictors to maintain adequate statistical power. This is not to negate the importance of social interactions with non-conational international students but rather a choice based on theoretical and statistical considerations. We suggest that future study may properly examine the relationship between social support from this group and acculturative stress by collecting a larger sample size. Lastly, because we measured SNS use as a global estimate of time spent on SNSs without discriminating the specific nature of use, this study was unable to identify which activity on SNS may have the biggest association with perceived social support and acculturative stress. Future research should explore the relationships between SNS use and perceived social support and acculturative stress by measuring specific activities engaged in on SNS.

6. Conclusion

The current study contributes to the existing literature in the following ways. First, discriminating between home and host SNS, SNS use with distant conational and local conational, perceived social support from home and host country, this study painted a more nuanced picture regarding the relationships between SNS use, perceived social support, and acculturative stress. The more specific relationships identified in this study may help understand the mechanism, resolve the inconsistencies, and complement the one-sided studies that only focused on home or host country variables. Second, by considering the effects of mass media, non-SNS mediated communication, and face-to-face contact, we situate the effects of SNS in the whole media ecological framework that allows us to better grasp the comparative aspects. Third, one of the most important issues in social media research is its effects on mental health, and this study contributes to this debate using the international student population. Lastly, as international students share certain similarities with the immigrant population, and they may also stay in the host society after graduation, this study could also offer insights into understanding immigrants' acculturation experience with emerging communication technologies in the 21st century.

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