

# Bounded Solidarity Confirmed? How Korean Immigrants' Mobile Communication Configures Their Social Networks

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*A hierarchical regression analysis of U.S.-based Korean immigrants' mobile communication use (i.e., voice calling and texting) and their social network characteristics (i.e., network size, diversity, and centrality) revealed significant associations between texting with coethnic strong ties and network centrality within the ethnic community. Korean immigrants who texted frequently with both coethnic and host weak ties had larger networks. Network diversity was, however, associated only with voice calling with host ties (both strong and weak). These findings have implications for theories of bounded solidarity. Specifically, the results suggest that mobile communication is significantly associated with (a) denser social networks, and (b) an important and unique source of social capital embedded in immigrant communities.*

**Keywords:** Mobile Communication, Social Networks, Strong Ties, Weak Ties, Coethnic Ties, Host Ties, Bounded Solidarity Theory.

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There are more than 1.4 million Koreans in the United States, which makes them the fifth largest Asian ethnic group after Chinese, Indian, Filipino, and Vietnamese. Koreans are part of a large wave of new Asian immigrants, which recently surpassed that of Hispanics (Census, 2010; Pew Research Center, 2012). The first generation of Korean immigrants and their descendants are known for their cohesive ethnic community and strong preference for interacting with coethnics, that is, their fellow Koreans (Min, 2006; Pew Research Center, 2012). Korean immigrants' tight social networks seem to be maintained well by their mobile communication and online communities. KakaoTalk and Line have emerged as dominant mobile chatting applications, and have been widely adopted among Koreans and Korean

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immigrants alike. Korean immigrants have also formed various online communities such as MisysUSA.com and Heykorean.com to exchange valuable information in their daily lives (Lee, 2013).

Past research on immigrants' communication media usage has shown both ethnic and host society media play significant roles in their sociocultural adaptation to the new environment (Matsaganis, Katz, & Ball-Rokeach, 2011). However, considering the possibility of many immigrant communities being densely knit social networks, it is anticipated that the use of mobile phones will also be critical in their maintenance of social ties. A growing body of research has revealed that migrant workers sustain their transnational ties with families and friends through mobile communication (Law & Peng, 2008; Paragas, 2009), which has both positive and potentially negative effects on migrant workers' settlement and acculturation in the host society (Chib, Aricat, & Ling, 2012).

Many studies of Korean immigrants suggest that well-established immigrant organizations, especially Protestant churches for Koreans, provide space and opportunities for social networking (Kwon, Kim, & Warner, 2001). Gathering with their coethnic counterparts is common among many immigrant communities to exchange information, provide social support, and help one another. This process of social networking generates unique forms of social capital for immigrant communities (Portes & Sensenbrenner, 1993). The social and cultural consequences of intensive networking revolving around an ethnic cultural institution invoke an interesting problem to study because those immigrant organizations not only help immigrants adapt to the new environment by providing various resources, but ironically also work in the other direction by providing an insular community of their own (Lee, 2014).

The current study explores a Korean immigrant community from the standpoint of organizational communication networks, addressing how the organizational members' social interactions are structured, and how they use mobile communication to maintain social networks. For many migrant workers, mobile phones have become the predominant communication technology for staying in touch with family and friends abroad. It has become existential precondition as they move around looking for jobs (Chib et al., 2012; Law & Peng, 2008). Mobile communication affords migrants convenient information searches, quick reactions to possible work opportunities, and frequent connections with loved ones (Paragas, 2009). Against this backdrop, the current study examines how mobile communication practices of Korean immigrant community members are associated with their social networks.

## Literature Review

Due to the lack of mobile communication research focusing on "immigrants" who have settled down in their destination countries, we instead draw on prior studies of "migrants," i.e., those who travel for work purposes, but might become immigrants eventually. Migrant workers can strategically use mobile phones to maximize their job opportunities and manage social relationships with their both strong and weak ties (Law & Peng, 2008). Nevertheless, the increased availability of transnational communication based on the mobile Internet, along with the relative ease of communicating with coethnics (due to the limited host language proficiency), seems to reinforce migrant workers' strong tie communication rather than facilitate weak tie communication. More frequent communication with coethnics and strong ties, such as close friends and family members, might ultimately delay the process of their acculturation (Chib & Aricat, 2014). Chib et al. (2012) reported that migrant workers in South Asia networked with coethnics in the host society and acquired new skills as a result of mobile communication. Some migrants were members of faith-based and voluntary organizations from which they received emotional support as well as spiritual wellbeing (Chib et al., 2012).

## Mobile Communication and Social Networks

Ling, Yittri, Anderson, and DiDuca (2003) found people without pre-established social networks could not easily take advantage of the Internet and mobile phones. Other researchers also argued it is beyond the capability of communication technologies to create social networks. People can still go online and try meeting new people such as in online dating websites (Gibbs, Ellison, & Heino, 2006), but more often they use the Internet and mobile phones to maintain existing social ties rather than to create new ones. boyd and Ellison (2007) also reached a similar conclusion that social network sites (SNSs) primarily support pre-existing social relations.

Due to its field-based emphasis on mobile communication's influence on social networks, Donner's (2006) research on mobile phone uses by microentrepreneurs in Rwanda added a notable discussion to this line of inquiry. Although the proportion of mobile phone usage for contacting existing ties was higher than that for new contacts, Donner found that small business owners who resided in low tele-density areas (i.e., where many residents did not yet have means of telecommunication) could benefit from their mobile ownership. Those microentrepreneurs had constant and immediate connections with their new business ties. Donner explained his finding as confirmatory evidence showing that use of mobile technology led to both structural change in society and increased productivity. He emphasized that the most sudden changes to a person's social network—the introduction of new ties and the expansion of networks—were experienced by those businesspeople who had purchased the first phone of their lives.

While Donner's (2006) research showed how mobile communication for business motivation could contribute to social network change, Wei and Lo (2006) reported that the mobile phone supplements the landline as a means of strengthening family bonds, expanding psychological neighborhoods, and facilitating symbolic proximity to people. Particularly, Wei and Lo found that for those with poor social connections, mobile communication offered a unique advantage by conferring instant membership in a social community. Their finding seems contradictory to previous research on mobile communication's influence on social network configuration, but it resonates with Donner's (2006) finding about mobile phone uses of microentrepreneurs. Moreover, Lewis, Kaufman, Gonzalez, Wimmer, and Christakis's study (2008) also revealed that racial and ethnic minority groups of college students used social media more actively to enhance their social networks in terms of diversity and size than their counterparts. Lewis et al. found that subgroups of their sample, defined by gender, race/ethnicity, and socioeconomic status, had distinctive networking behaviors. The aforementioned research findings confirmed that networks of social ties were latent dimensions of personal communication technology (PCT) usage, helped nest individuals within groups and groups within a society, and spread and coinfluenced cultural values (Katz & Aakhus, 2002).

Miyata, Boase, and Wellman (2008) studied social effects of keitai (i.e., mobile phone in Japanese) e-mail and PC e-mail in Japan. They reported that the young Japanese used mobile e-mails for maintaining existing relationships rather than developing new ones. The differential effects of mobile-based and PC-based e-mails were confirmed even after controlling for the effect of demographics, employment status, and social network characteristics. Miyata et al. also found a positive association between PC-based e-mail usage and personal network diversity, which suggested participants interacted with people from various backgrounds more frequently through PC e-mails than mobile e-mails. Based on the longitudinal study over three years, researchers raised a possibility of a young generation living insular lives while "remaining ignorant of how people from diverse social strata live and interpret the world" (p. 220) because young Japanese were found using keitai e-mail more frequently than PC e-mail.

### *Migrant workers' mobile communication*

The study reported here aims to better understand how mobile communication configures social networks of a bounded group in general, and more specifically, of an immigrant community. There is a paucity of research on immigrants' mobile communication, with the exception of migrant workers (Chib et al., 2012; Chib & Aricat, 2014; Law & Peng, 2008; Paragas, 2009; Wallis, 2011). The scant research though provides useful insight into how migrant workers can strategically use mobile phones to increase their job opportunities and manage social relationships with their newly created ties. For example, Law and Peng (2008) indicated that for migrant workers, mobile phones were important for building cyber-kinship networks in Guandong, China. Mobile communication not only helped migrants maintain existing kin relationships in an "expanded spatiotemporal context," but also to "prolong new relationships" developed in their workplace (Law & Peng, 2008). On the contrary, Wallis (2011) claimed "mobile phones did not necessarily help migrant women workers build connections with those in higher social strata than themselves" due to the structural barriers of culturally specific network (i.e., *guanxi*) in Chinese society.

Similarly, Chib, Wilkin, and Mei Hua (2013) presented a nuanced picture of migrant workers' mobile phone usage in Singapore. Their research highlighted a gender difference that women Bangladeshi workers reported alleviating their stress by using mobile phones whereas men reported experiencing more stress when they used mobile phones, but also received frequent emotional support through mobile communication. These studies attested that migrant workers' mobile communication could be influenced by existing social positions such as networks and gender.

### **Bounded Solidarity and Immigrant Social Capital**

Past research confirmed that overall mobile communication strengthens existing social ties (De Gournay, 2002; Igarashi, Takai, & Yoshida, 2005; Ling et al., 2003; Ling, 2008; Matsuda, 2005). Therefore, mobile communication generates bonding social capital, rather than creating new weak ties (Granovetter, 1973) for bridging social capital (Putnam, 2000). Ling (2008) summarized this phenomenon with the theoretical concept of "bounded solidarity," which refers to the major effect of mobile communication on social network changes. Since mobile phone users are more likely to communicate with their existing ties, their communication networks become denser within the boundary of existing social groups. However, there are some exceptional cases such as microentrepreneurs in Rwanda (Donner, 2006), migrant workers in China (Law & Peng, 2008), racial and ethnic minorities on Facebook (Lewis et al., 2008) or those poorly connected socially in Taiwan (Wei & Lo, 2006). For those seemingly contradictory cases, mobile communication also facilitates creation and maintenance of new ties.

The current study tries to further this line of inquiry by addressing how mobile communication intersects with social network characteristics such as size, diversity, and structural positions (Campbell & Kwak, 2012). Except for a few cases (Igarashi et al., 2005), previous research has not directly examined network properties, but used proxy measures to infer the impact of mobile communication on social network changes. For example, Donner (2006) used the proportion of new entrants in social network as a measure of change. By incorporating direct measures of social networks, especially of a structural position in a given network (i.e., centrality; Freeman, 1979; see Method section of this paper for an operational definition), the current study complements prior research and seeks to measure the concept of social capital more accurately and holistically. Social capital is defined as both actual and potential resources embedded in social networks (Lin, 2001). Depending on network size, diversity, and centrality, the effect of social capital can be positive or potentially negative (Adler & Kwon, 2002).

As an attempt to refine the concept of social capital, Portes and Sensenbrenner (1993) distinguished four specific sources: (a) value introjections, (b) reciprocity transaction, (c) bounded solidarity, and (d)

enforceable trust. Among these four types of sources, Portes and Sensenbrenner noted bounded solidarity and enforceable trust were closely related to immigrant social capital. Especially, 'bounded solidarity' coincided with the term used by Ling (2008) when describing the effect of mobile communication on social networks. Therefore, the same terminology needed to be conceptually differentiated. *Bounded solidarity* focuses on situational circumstances leading to a group-oriented behavior (Portes & Sensenbrenner, 1993). The classic sources of bounded solidarity are exemplified by Marx's analysis of the rise of proletarian consciousness and the transformation of workers into a class-for-itself, the internal solidarity created by a common awareness of capitalist exploitation. Portes and Sensenbrenner (1993) explain bounded solidarity does not arise out of the internalized values or from individuals' reciprocal exchanges of favors, "but out of the situated reaction of a class of people faced with common adversities" (p. 1325). Thus, immigrants can form bounded solidarity within their ethnic communities while faced with an indifferent or even hostile, host environment.

### *Mediated communication and social capital*

Whether mediated communication enhances or impedes the formation of social capital, originally generated from offline relationships, has been studied extensively (e.g., Ellison, Steinfield, & Lampe, 2011; Ellison, Vitak, Gray, & Lampe, 2014; Haythornthwaite, 2005; Thelwall, 2008; Wellman, Haas, Witte, & Hampton, 2001) with some finding positive effects. Williams (2007) found that general Internet usage was positively associated with bridging social capital, while discouraging bonding social capital. However, relationship building and its resulting social capital might take on a distinctive form in social network sites (SNSs) due to their unique orientation and architecture geared toward social connectivity (boyd & Ellison, 2007; Katz & Rice, 2002). A study of MySpace profiles revealed a relaxed concept of friendship on SNSs led to communicating not only with close friends, but also with acquaintances and strangers (Thelwall, 2008). Close connections can also be reinforced through uses of SNSs. Thus, SNSs can be used for increasing bonding social capital (Ellison et al., 2011). Nevertheless, both the academia and press have raised a concern about embedded algorithms (so called, "filter bubbles") of SNSs and search engines that possibly hinder users from interacting with diverse others (Pariser, 2011). Because of the algorithms that control and structure the flow of communication and information, media users are more likely to be exposed to others who share similar perspectives, backgrounds, and opinions rather than find themselves challenged by discussions with diverse others.

As such, numerous studies discern that different types of technologies are associated with distinctive social ties. Mobile phones, especially voice calling and texting, and Instant Messaging (IM) seem more relevant to strong ties and small cohesive networks whereas PC e-mails and SNSs are related to weak ties and large diverse networks (Ellison et al., 2011, 2014; Kim, Kim, Park, & Rice, 2007; Miyata et al., 2008). These research findings support the idea that network context as a specific condition of communication affects how one chooses, uses, and perceives different personal communication technologies (Katz & Aakhus, 2002). For this study, we did not include web-based application usage of mobile phones such as e-mail, SNSs, or IM because (a) the theory of bounded solidarity (Ling, 2008) was proposed when uses of mobile applications were not yet prevalent, and (b) even nowadays, voice calling and texting appear to be the two major functions of mobile phones (Ling & Baron, 2013).

De Gournay (2002) argued that mobile communication fosters a decrease in the number of social ties as networks become less diffused and more cohesive. Gergen (2008) characterized this trend of network change as "monadic clustering" and theorized that social networks become insular and detached from the democratic process, thus potentially negative for civil society, when they cluster around small bounded groups. Mobile communication is private in its nature and possibly strengthens immigrants' social ties with their family and coethnic friends rather than creating new ties with host nationals.

The more direct ties immigrants have with their coethnic community members, the more central they become in their ethnic social networks. Thus, the following first set of hypotheses were proposed to examine the association between mobile communication and Korean immigrants' network centrality within their ethnic community:

**H1a.** The frequency of Korean immigrants' voice calling with coethnic strong ties will be positively associated with network centrality within their ethnic community.

**H1b.** The frequency of Korean immigrants' text messaging with coethnic strong ties will be positively associated with network centrality within their ethnic community.

Due to the possibility of using social media through smartphones, which has been an increasing trend, we also drew on research in social media and network characteristics. Studies of Facebook uses and their impact on college students' perceived social capital revealed distinctive types of connecting strategies (i.e., initiating, maintaining, and social information seeking) and relationship maintenance behaviors (Ellison et al., 2014). Social information seeking was a unique communication strategy that could convert latent ties into weak ties, which was associated with perceived bridging social capital (Ellison et al., 2011). Similarly, a set of relationship maintenance behaviors on Facebook was also related to perceived bridging social capital (Ellison et al., 2014). When college students had fewer actual friends on Facebook, they could benefit from increasing Facebook-specific relationship maintenance behaviors in terms of bridging social capital (Ellison et al., 2014). This finding confirmed social network conditions, especially the size of actual friends, influence how individuals use communication technologies, which in turn affects their social capital. Some immigrants might often use the mobile phone for contacting both coethnics and noncoethnics, and strong as well as weak ties. In that case, they will be more likely to have larger, more diffuse and diverse social networks. Thus, the following sets of hypotheses were proposed to examine the association between mobile communication (i.e., voice calling & text messaging) and Korean immigrants' network size (H2a&b, H4a&b) and diversity (H3a&b, H4c&d):

**H2a.** The frequency of Korean immigrants' voice calling with coethnic weak ties will be positively associated with their network size.

**H2b.** The frequency of Korean immigrants' text messaging with coethnic weak ties will be positively associated with their network size.

**H3a.** The frequency of Korean immigrants' voice calling with host strong ties will be positively associated with their network diversity.

**H3b.** The frequency of Korean immigrants' text messaging with host strong ties will be positively associated with their network diversity.

**H4a.** The frequency of Korean immigrants' voice calling with host weak ties will be positively associated with their network size.

**H4b.** The frequency of Korean immigrants' text messaging with host weak ties will be positively associated with their network size.

**H4c.** The frequency of Korean immigrants' voice calling with host weak ties will be positively associated with their network diversity.

**H4d.** The frequency of Korean immigrants' text messaging with host weak ties will be positively associated with their network diversity.

## Methods

### Data Collection

To study the relationships between Korean immigrants' social networking and their mobile communication in the context of a local community, a Korean immigrant church located in suburban New Jersey was selected as a sample organization. The state of New Jersey has one of the largest Korean immigrant populations along with California, New York, Illinois, and Georgia. The church organization was founded in 1974 and had about 450 adult members registered as Korea-speaking congregants at the time of data collection. Utilizing the most updated member registry, surveys were mailed to each individual and household (when couples were registered) from November 2011 till January 2012. The church members were reminded about the survey through phone calls and interpersonal contacts by the first author until a response rate of approximately 40% was achieved by September 2012 ( $N = 178$ ).

### Sample description

There were 80 males (45.7%) and 96 females (54.3%) who participated in the survey and two respondents did not report their biological sex. Participants' age ranged from 21 to 87 ( $M = 52.0$ ,  $SD = 13.5$ ) and most participants (98.3%) were the first generation of Korean immigrants. About one third of the participants ( $n = 52$ , 31.3%) had professional occupations such as lawyers, doctors, or accountants, and 64 participants (38.6%) reported being small business owners or working for nail salons and groceries. Owning small businesses such as a laundry shop, grocery, and nail salon or working in those businesses have been reported as a typical case for Korean immigrants in the U.S. (Min, 2006). Fifty participants (30.1%) were unemployed being a student, full-time homemaker, or retired. The distribution of monthly income level was trifold among those making less than \$2500 (31.9%), between \$2500 and \$5500 (34.4%), and more \$5500 (33.7%). Over 75% of the valid sample reported an education level of college graduate or higher, and 88.1% of the respondents were married.

## Analysis

### Measurement

For demographics, participants' age, gender, occupation, education, and income level were included. Measures of mobile communication included the frequency of voice calling and text messaging for contacting strong and weak ties, both of coethnic and host national (7-point scale; 1 = *not use at all*, 7 = *use very often*). The strength of ties was operationalized by the communication frequency: Friends and coworkers contacted on a daily/weekly basis were considered strong ties, whereas those contacted less frequently than daily/weekly were defined as weak ties. Tie strength does not always equate with frequency of communication as people could have strong family ties with relatively infrequent communication. Researchers have measured tie strength using various methods like relational closeness, reciprocity, and time known each other along with frequency of contacts. Nevertheless, the current study probed only about Korean immigrants' relations with friends and coworkers when asking their mobile communication. Thus, it partially eliminated the chance of missing strong family ties. Each participant was asked to provide information about people they contacted regularly when seeking daily information. Among those names generated by participants' answers, members of the sampled community were identified in the process of constructing the whole network of information exchange.

### *Operationalization of social capital*

In exploring the relationships between Korean immigrants' mobile communication and social capital in their community, social capital was defined as resources embedded in social networks (Lin, 2001). Three components of social networks were measured in this study: network size, diversity, and centrality. Network size was operationalized as a total number of friends and coworkers (both coethnic and host national). Network diversity was operationalized as the ratio between coethnic versus host national ties. A percentage of network diversity score was calculated by dividing the number of host ties with one's total number of ties and multiplying by 100.

For network centrality, each participant's Indegree centrality score (Freeman, 1979) was calculated by the ratio between number of ties coming into the actor and total number of ties within the information network. The concept of degree centrality and its standardized form captures how many direct ties one has within a given network in proportion to the whole network size (Wasserman & Faust, 1994). When directions of social exchanges are considered, both Indegree and Outdegree centrality can be calculated. The higher an individual's Indegree centrality score, the more direct ties the person has within the network, and more members seek informational resources from that person. Outdegree centrality indicates how actively the person seeks out information from other people in the network, but the survey asked a fixed amount of sources for information seeking (i.e., six); therefore, most respondents' Outdegree score was six or less. Naturally, participants with high Indegree centrality occupy central positions in the network by being sources of information for many people in the network. Network analysis software, UCINET (Borgatti, Everett, & Freeman, 2002) was used to obtain the Indegree centrality scores. Figure 1 illustrates the information exchange network of the sampled Korean immigrant church. The information network had a total of 332 ties formed among community members and about 13% of those ties were reciprocated, which meant 44 ties were two-way exchanges and the rest were unidirectional. The following section provides results of hypotheses testing, followed by discussion of research findings.

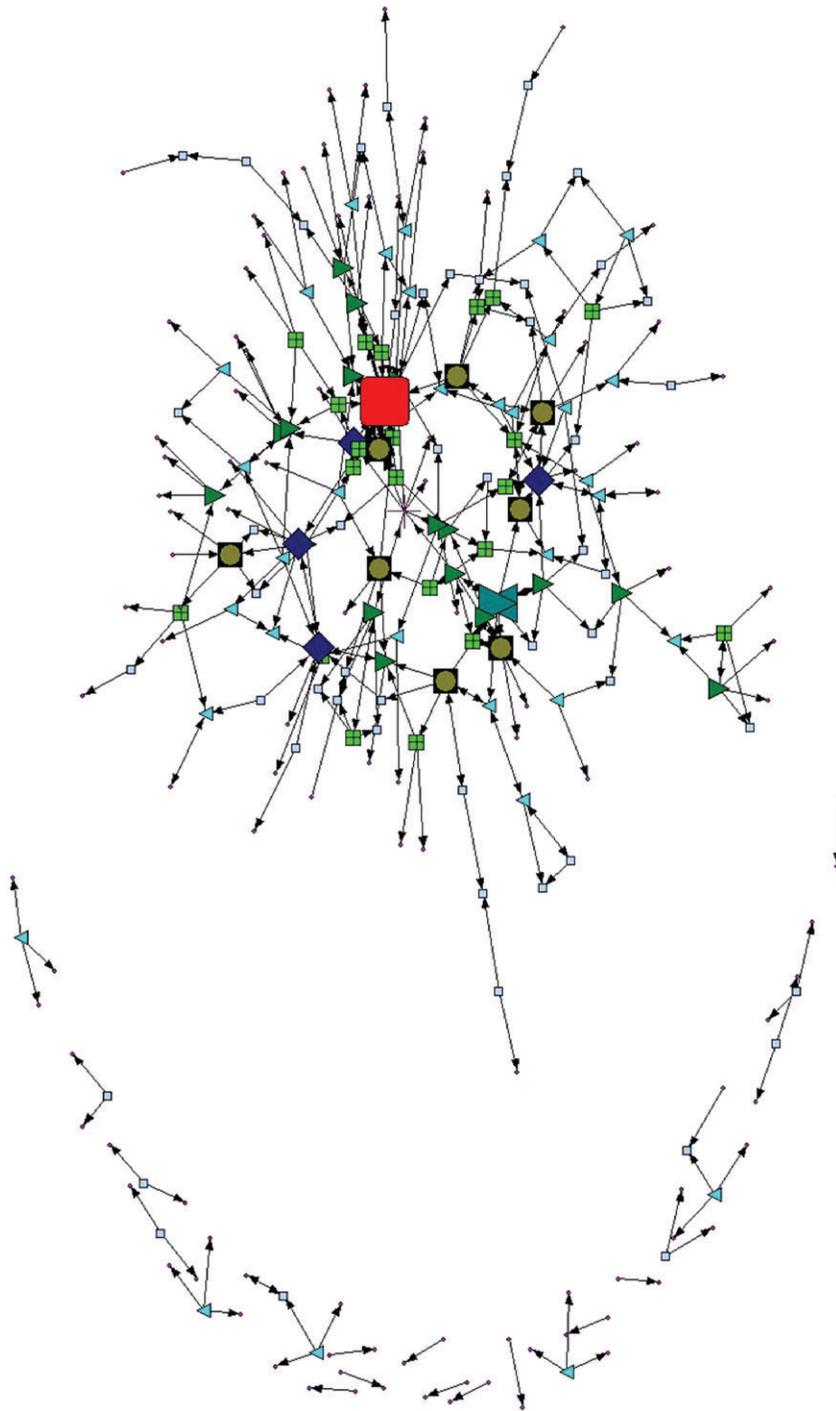
## **Results**

The present study examined how Korean immigrants' social network characteristics (i.e., size, diversity, and centrality) were associated with their mobile communication with distinct social ties (i.e., coethnic vs. host national, strong vs. weak ties). Bivariate correlations (see Table 1) and hierarchical linear regression analyses were conducted to test the four sets of hypotheses on the relationships between mobile phone uses (i.e., voice calling, texting) for four different ties and three network variables. The analysis results are explained in the order of proposed hypotheses.

### **Mobile Communication With Coethnic Strong Ties and Network Centrality (H1s)**

First, a positive association was hypothesized between Korean immigrants' mobile communication (i.e., H1a for voice calling, H1b for texting) with coethnic strong ties and network centrality. The result of a correlation analysis partially supported the first hypothesis as there was a significant positive association found between the frequency of texting and network centrality,  $r = .19, p < .05$ . The frequency of voice calling to contact Korean strong ties was positively correlated with network centrality, but the correlation coefficient was not statistically significant,  $r = .11, p = .20$ . There was a strong positive association observed between the frequency of voice calling and that of texting for contacting Korean strong ties,  $r = .43, p < .001$ , which means those who used voice calling frequently to contact their close Korean friends and coworkers also used texting as frequently.

When analyzed together with demographic variables controlled in a hierarchical regression modeling, texting with coethnic strong ties did not remain as a significant predictor of network centrality in the



**Figure 1** Information Exchange Network of a Korean Immigrant Church. Note. Different shapes, colors, and size of nodes represent distinctive levels of Indegree centrality; the bigger the node is, the higher the centrality is, and the same shape represents the same level of centrality within the community ( $n = 289$ ).

**Table 1** Bivariate Correlations Between Major Variables With Means and Standard Deviations

Variables	<i>M (SD)</i>	1	2	3	4	5	6	7	8	9	10
1. Vcostrong	3.2 (1.7)	–									
2. Tcostrong	1.9 (2.0)	.43**	–								
3. Vcoweak	2.4 (1.4)	.39**	.16*	–							
4. Tcoweak	1.1 (1.6)	.32**	.61**	.36**	–						
5. Vhstrong	1.1 (1.6)	.16*	.26**	.17*	.30**	–					
6. Thstrong	0.7 (1.4)	.22**	.45**	.17*	.46**	.59**	–				
7. Vhweak	0.8 (1.2)	.24**	.25**	.19*	.33**	.49**	.32**	–			
8. Thweak	0.4 (1.0)	.20*	.43**	.20*	.49**	.32**	.60**	.59**	–		
9. Netsize	1.2 (0.4)	.22**	.25**	.13	.33**	.43**	.34**	.38**	.36**	–	
10. Netdiv	16.4 (20.5)	.01	.09	–.03	.06	.54**	.37**	.47**	.27**	.31**	–
11. Netcent	0.7 (0.6)	.11	.22**	.03	.06	–.01	–.01	.05	.04	–.04	.01

V: Voice calling, T: Texting, co: Coethnic, h: Host, strong: Strong ties, weak: Weak ties, Netsize: Network size, Netdiv: Network diversity, Netcent: Network centrality;

\* $p < .05$ ,

\*\* $p < .01$ .

**Table 2** Hierarchical Regression Analyses Predicting Network Centrality (H1s)

	Model 1: Controls	Model 2: Mobile comm.	Model 3: Age Controls	Model 4: Moderation
	Standardized Betas ( <i>t</i> -scores)			
Gender: Women	–.006 (–.073)	–.011 (–.142)	–.034 (–.433)	–.034 (–.438)
Education	.057 (.750)	.065 (.867)	.048 (.641)	.049 (.649)
Monthly Income	.180* (2.33)	.166* (2.14)	.156* (2.02)	.152† (1.89)
Age			–.151† (–1.74)	–.152† (–1.74)
Voice Calling with Coethnic Strong Ties (H1a)		.026 (.322)	.027 (.337)	.029 (.351)
Texting with Coethnic Strong Ties (H1b)		.167* (2.04)	.089 (.958)	.050 (.201)
Moderation: Texting by Age				.041 (.173)
Adjusted $R^2$	.024	.046*	.057*	.051*

† $p < .10$ , \* $p < .05$ .

regression model probably due to its strong negative correlation with age variable,  $r = -.52$ ,  $p < .001$  (see Model 3 in Table 2). The older a Korean immigrant was, the less frequently they used texting to contact Korean strong ties. Therefore, a moderation effect of age variable was tested with an interaction term with texting variable, but the result was not statistically significant (see Model 4). Texting with coethnic strong ties remained significant,  $\beta = .17$ ,  $t = 2.04$ ,  $p < .05$ , though when controlling for the effect of income,  $\beta = .17$ ,  $t = 2.14$ ,  $p < .05$ , without age variable entered in the regression,  $F = 2.98$ ,  $p < .05$ ,  $R^2_{\text{adjusted}} = .05$  (see Model 2).

The result can be interpreted in terms of two possible relationships between Korean immigrants' network centrality and texting. First, young and relatively well-off Korean immigrants who are more central in their community network by having many members seeking daily information from them, are more likely to communicate with their Korean strong ties via texting than those who are not as central as they are. Another possibility is that Korean immigrants who use texting more frequently to contact their Korean close friends and coworkers can make themselves more embedded in the ethnic community network as communication via texting enables relationship maintenance with strong ties, especially among younger generations. Overall, H1a about the association between voice calling with coethnic strong ties and network centrality was not supported whereas H1b about texting was partially supported by the results of regression analysis.

### **Mobile Communication With Coethnic Weak Ties and Network Size (H2s)**

The present study hypothesized a positive association between Korean immigrants' mobile communication (i.e., voice calling for H2a, texting for H2b) with coethnic weak ties and their network size. The result of a hierarchical linear regression partially confirmed the second set of hypotheses,  $F = 5.95, p < .001$ . The regression model explained 14.4% of the variance in network size, and the frequency of texting with Korean weak ties was a significant predictor of network size,  $\beta = .34, t = 4.24, p < .001$ , after controlling for the effect of education level,  $\beta = .24, t = 3.32, p < .01$ . Even though the frequency of voice calling for contacting Korean weak ties was positively correlated with network size, the association was not statistically significant,  $\beta = .02, t = .29, p = .77$  (Thus, H2a rejected). The significant correlation between voice calling and texting with Korean weak ties was not strong enough to be concerned about multicollinearity issue,  $r = .36, p < .001$ . The results of the second set of hypotheses testing suggest that Korean immigrants who frequently use texting via mobile phones to communicate with Korean acquaintances tend to have larger social networks (Thus, H2b confirmed). Since a causal relationship cannot be established with cross-sectional data, it is also possible that Korean immigrants who have large social networks use texting to maintain their Korean weak ties.

### **Mobile Communication With Host Strong Ties and Network Diversity (H3s)**

The third set of hypotheses of the current study proposed a positive association between Korean immigrants' mobile communication (i.e., H3a for voice calling, H3b for texting) with host strong ties and network diversity. It was expected if Korean immigrants frequently communicate with host national friends and coworkers, they would have a diverse social network that is consisted not only of fellow Koreans but also of Americans. A correlation analysis supported these hypotheses showing significant positive relationships between mobile phone uses and network diversity for both voice calling,  $r = .55, p < .001$ , and texting,  $r = .37, p < .001$ . Using voice calls via mobile phones to contact host strong ties was a significant predictor of network diversity,  $\beta = .45, t = 4.79, p < .001$ , after controlling for the effect of monthly income and education level in a hierarchical regression analysis,  $F = 10.98, p < .001$ . Thus, H3a was supported. The model explained about 30% of the variance in network diversity. However, using text messages to contact host strong ties did not remain as a significant predictor of network diversity in the regression model,  $\beta = .12, t = 1.28, p = .20$ . Therefore, H3b was rejected. A possible multicollinearity issue for a strong correlation between predictor variables (i.e., voice calling and texting with host strong ties,  $r = .58, p < .001$ ) was investigated. As a result, variance inflation factor (VIF) for both predictor variables was less than 1.6, which means multicollinearity was not a concern (Belsley, Kuh, & Welsh, 1980).

The result of the third set of hypotheses testing can be interpreted that Korean immigrants who communicate with close friends and coworkers of host nationals via mobile voice calling (and texting,

**Table 3** Hierarchical Regression Analyses Predicting Network Size and Diversity (H4s)

	Network Size (H4a & b)		Network Diversity (H4c & d)	
	Model 1: Controls	Model 2: Mobile comm.	Model 1: Controls	Model 2: Mobile comm.
	Standardized Betas ( <i>t</i> -scores)			
Gender: Women	.042 (.539)	.090 (1.24)	-.109 (-1.40)	-.041 (-.572)
Education	.221** (2.93)	.242** (3.47)	.144 <sup>†</sup> (1.91)	.152* (2.21)
Monthly Income	.079 (1.02)	.042 (.581)	.129 <sup>†</sup> (1.67)	.072 (1.01)
Age	-.073 (-.979)	.018 (.251)	-.005 (-.071)	.055 (.785)
Voice Calling with Host Weak Ties		.230** (2.64)		.405*** (4.72)
Texting with Host Weak Ties		.228* (2.61)		.046 (.532)
Adjusted <i>R</i> <sup>2</sup>	.046*	.194***	.048*	.244***

<sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

to a certain extent) tend to have diverse social networks. A causal relationship cannot be claimed whether mobile communication increases network diversity, or vice versa. Nevertheless, a fairly strong positive association between voice calling with host strong ties and network diversity was observed from the regression analysis.

#### Mobile Communication With Host Weak Ties and Network Size and Diversity (H4s)

Last, the present study hypothesized a positive association between Korean immigrants' mobile communication (i.e., H4a & H4c for voice calling, H4b & H4d for texting) with host weak ties and network size and diversity. A correlation analysis resulted with all significant associations among relevant variables as predicted: voice calling with network size,  $r = .38$ ,  $p < .001$ , and network diversity,  $r = .47$ ,  $p < .001$ ; texting with network size,  $r = .36$ ,  $p < .001$ , and network diversity,  $r = .27$ ,  $p < .001$ . A hierarchical regression analysis mostly supported the last set of hypotheses by showing that mobile communication with host weak ties explained a significant amount of the variance (19.4%) in network size,  $F = 8.12$ ,  $p < .001$ , after controlling for the effect of demographic variables. Both voice calling,  $\beta = .23$ ,  $t = 2.64$ ,  $p < .01$ , and texting,  $\beta = .23$ ,  $t = 2.61$ ,  $p < .05$ , for contacting host weak ties were statistically significant predictors of network size. Thus, H4a and H4b were supported (see Table 3).

Another hierarchical regression analysis resulted with a similar trend between mobile communication with host weak ties and network diversity,  $F = 9.19$ ,  $p < .001$ ,  $R^2_{\text{adjusted}} = .24$ . However, for network diversity, only voice calling (H4c) with host weak ties remained a significant predictor in the regression model,  $\beta = .41$ ,  $t = 4.72$ ,  $p < .001$ , and texting (H4d) did not,  $\beta = .05$ ,  $t = .53$ ,  $p = .60$ , after controlling for the effect of education level on network diversity,  $\beta = .15$ ,  $t = 2.21$ ,  $p < .05$  (the effect of education on network size,  $\beta = .24$ ,  $t = 3.47$ ,  $p < .01$ ). The result suggested that Korean immigrants who communicate frequently with host weak ties via mobile voice calls tend to have more diverse and larger social networks.

In summary, the results of four sets of hypotheses testing revealed that Korean immigrants' mobile phone uses were distinctively associated with their social network characteristics. Korean immigrants' network centrality within their ethnic community showed a significant relationship only with texting

with coethnic strong ties whereas network size was related to mobile communication with weak ties of both coethnic (texting) and host nature (texting and voice calling). Network diversity was strongly associated with mobile voice calling with host ties of both strong and weak ties.

## Discussion

The current study explored the relationships between Korean immigrants' mobile communication and their social capital, measured by social network characteristics. The research was driven by the theoretical premises of Apparageist (Katz & Aakhus, 2002) and Ling's (2008) concept of bounded solidarity. Apparageist theory suggests that social networks are latent dimensions of mobile communication, so depending on mobile users' network conditions, their mobile phone usage can vary. The concept of bounded solidarity indicates that mobile communication can foster insularity of certain communities from the rest of society because community members can strengthen their social ties via mobile communication. Past research has shown mixed findings on the effects of mobile communication on social networks. Some studies found that mobile phone usage strengthens existing social ties and makes social networks more dense and insular (Miyata et al., 2008), whereas others revealed that one's current network situation determines how mobile communication is used to maintain and increase new, weak ties (Donner, 2006; Lewis et al., 2008; Wei & Lo, 2006).

The findings of the current study suggest that frequent mobile phone usage could contribute to increasing Korean immigrants' network size, especially through texting with coethnic weak ties and through voice calling with host ties. Mobile texting for communicating with Korean strong ties was specifically associated with network centrality that measured how deeply Korean immigrants were embedded within their ethnic community. Finally, mobile communication with host national ties was strongly related to network diversity. As such, the theoretical premise of Apparageist found empirical support in that Korean immigrants' social network characteristics were significantly associated with their mobile communication practices.

The concept of bounded solidarity was confirmed, only partially, with the case of mobile texting with coethnic strong ties. Korean immigrant participants of this study seemed to differentiate between voice calling and texting for communicating with different kinds of people in their social networks. Only when Korean immigrants used a certain form of mobile communication (i.e., texting) for a certain type of relationship (i.e., close Korean friends and coworkers), the more deeply embedded they were in a local ethnic community. Over time, through repeated practices of texting with coethnic strong ties, their social networks possibly became tighter and consisted mostly of existing Korean friends and coworkers. Overall, research participants contacted their fellow Koreans more frequently through mobile phones than host ties, but mobile communication did not seem to cause insularity of social networks unilaterally.

According to Matsuda (2005), increasing urbanization and mobility of modern society bring wider pools of social networks, larger network size, and diversity. Mobile communication allows partial and selective maintenance of social relationships, but the quality of those relationships can be rich as mobile communication strengthens social ties. The results of this study support Matsuda's theory in that participants used mobile communication selectively for distinctive social ties. Their frequent uses of texting with close friends and coworkers of Korean tend to embed them more deeply within their intracultural community networks (i.e., ethnic church). The results also show that young and relatively well-off Korean immigrants in particular were central in their ethnic resource network. Thus, Miyata et al.'s (2008) concern about Japanese youths' keitai usage seemed also relevant to the case of young Korean immigrants because mobile communication with strong ties was associated with their network centrality. Nevertheless, mobile communication with non-Korean friends and coworkers afforded immigrants more opportunities to have diverse and large social networks.

The research findings also highlight the importance of mobile communication in association with network size and diversity. Campbell and Kwak (2012) have found that political discussions with like-minded strong ties over mobile phones can positively influence civic society when those discussions happen in larger networks. Although people tend to mostly confirm each other's opinion when they share similar political views and orientations, being exposed to *large* networks allow more diverse interactions that could reveal many alternatives to specific political issues. The current study adds to Campbell and Kwak's findings that specific types of mobile communication with distinctive ties, namely texting with coethnic weak ties and voice calling with host ties, are associated with participants' network size.

### **Limitations and Directions for Future Research**

Due to the nature of convenience sampling and cross-sectional data, this study's findings have limited generalizability. Other types of community groups, both online and offline, than a Korean immigrant church can be studied to see if the results are reproducible. In addition, no explicit causal claims can be made about significant associations found between mobile phone uses and social networks. A future study should collect longitudinal data to distinguish the antecedent in the relationship and also include web-based applications available through smartphones in the survey to explore their potential influences on social networking.

More questions can be raised about the consequences of immigrant social network dynamics and mobile communication. If similar patterns of networking continues over time, Korean immigrants, especially those central in their ethnic community, could be more isolated from the rest of society; they might not have enough chance to interact with non-Koreans and be exposed to new information, various perspectives and cultures outside of their community boundary. Therefore, the concern of monadic clustering (Gergen, 2008) and bounded solidarity (Ling, 2008) still remains salient for those using mobile communication mostly with their strong like-minded ties within a small social network. Another useful dimension to explore is whether the religious nature of the group under study made a difference. It could be that people who are drawn to the qualities of religious institutional life have different aims and processes related to their use of mobile communication for social networking. There are hints in other research (Campbell, 2006) to believe this might be the case, but this topic remains underexplored.

### **Conclusion**

The present study extends the theory of social capital, specifically related to bounded solidarity, identified as one of the main effects of mobile communication on social networks (Ling, 2008), and a source of social capital unique to immigrant communities (Portes & Sensenbrenner, 1993). It contributes a detailed analysis of the relationships between mobile communication and social networks; by demonstrating mobile phone usage itself is not unilaterally associated with network insularity, as was implied by the bounded solidarity theory, it suggests that modifications to that theory may be needed. Moreover, a specific association between a form of mobile communication (i.e., texting) and network centrality was found only among Korean immigrants who contacted their strong coethnic ties. Hence, the study may have revealed a "boundary" condition for bounded solidarity to occur. In light of this finding, future research that examines mobile communication's network effects should consider various types of social ties and their tie strength. Doing so would presumably yield more robust findings that give a more accurate picture of relationships as it advances theoretical insights.

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