Abstract

Given the important implications of social support on managing volunteers and their organizational commitment, we investigated how members of a Korean immigrant church ($N =$ 178) exchanged two distinctive kinds of social support (i.e., informational and tangible). We used theories of centrality and homophily to hypothesize patterns of social connections among organizational members. Employing exponential random graph modeling (ERGM), the current study estimated the likelihood of age and gender homophily/heterophily in forming supportive ties while simultaneously considering structural parameters. The results of analysis of variance showed that members with higher socioeconomic status and in official staff positions in the church were more central in the informational support exchange. However, ERGM for both types of support networks did not show hypothesized gender and age homophily/heterophily of Korean immigrants' support exchange, suggesting the importance of other potential organizational and cultural influences. The findings shed light on the internal structuring of organizational support networks and suggest practical implications for managing organizational volunteers.

Keywords: Social support, volunteer organization, social network analysis, homophily, centrality.

The Role of Status Differentials and Homophily in the Formation of Social Support

Networks of a Voluntary Organization

Religious organizations are major sites of voluntary organizing in America. Voluntary organizations have been a part of "historical features of the United States since its founding" (Lewis, 2013, p. 3) and often volunteer organizations have been religious organizations. The prominence of religious organizations was demonstrated in the human rights movement of African-American churches (mostly Southern Baptist) led by Rev. Martin Luther King, Jr. Still, about 62.6 million people volunteered through or for organizations of various kinds (not just religious) at least once between September 2012 and 2013 according to the Bureau of Labor Statistics (US Department of Labor, 2014). The scope and forms of modern volunteering might be changing. Lewis (2013) notes an increase in international, episodic, and online volunteering, highlighting that people devote significant time and energy to volunteering for many causes.

Social support is important in facilitating open communication and providing information to volunteers when they navigate uncertain, and often, informal job duties (Kedrowicz, 2013). Data from 139 countries demonstrated that volunteering and social support are intricately related to self-reported health (Kumar, Calvo, Avendano, Sivaramkrishnan, & Berkman, 2012), and members of religious organizations in the U.S. were found to be more civically engaged and reported a higher level of life satisfaction in general (Putnam & Campbell, 2010). In addition, churches have served as a critical source of social support for various racial and ethnic groups such as Asian Americans, African Americans, and Caribbean Blacks (Chatters et al., 2002; Kim & McKenry, 1998; Taylor, Chatters, Woodward, & Brown, 2013). In response to a call for research examining "novel aspects of support in unique contexts" (Kedrowicz, 2013, p. 107), we aim to reveal the structural configuration of organizational support networks and examine how

members choose their support exchange partners within the context of a Korean immigrant church. In doing so, this research contributes to deepening and widening knowledge of volunteer management and commitment (Kedrowicz, 2013).

Based on this larger context of volunteering, the current study explores a case of an ethnic community organization (i.e., Korean immigrant church), focusing on the structure and actor-level homophily (or the formation of ties with similar others) of social support exchange networks among its voluntary membership. Due to the lack of language proficiency and necessary resources, ethnic immigrant groups in a host society tend to form their own communities in which they can exchange various kinds of support with one another (i.e., ethnic homophily). Such ethnic communities can take diverse forms including: occupational associations, residential communities, student associations, or religious organizations (Waldinger, 2001). Community organizations based on a specific religion provide not only opportunities for social networking to immigrants but also ways to confirm their social identities (both ethnic and religious) through relevant rituals and customs. For Korean immigrants in the U.S. particularly, Protestant church organizations have been at the center of many immigrants' social lives (Hurh & Kim, 1990; Min, 1992); in fact, statistics show that more than 70% of Korean immigrants are members of church organizations (Pew Research, 2012). By participating in various church activities and volunteering for service positions (e.g., deacon, Sunday School teacher), members of immigrant churches organically build organizational social support networks.

The following section briefly reviews prior scholarship on social support with a specific focus on the two types of social support—informational and tangible support. Next, the social network perspective is introduced as a theoretical and analytic lens to investigate the formation

of social support networks in an ethnic church organization. The review of literature is followed by hypotheses about the structural configuration and social selection processes of organizational support networks.

Different Types of Social Support

Across disciplines, social support is widely recognized as important not only to our interpersonal lives but also to psychological and physical health (Burleson, Albrecht, & Sarason, 1994; Kim, 2014). Since social support can take a variety of forms, scholars have suggested a number of different typologies of social support based on its functions and utilities to articulate its nature and implications (for a review, see MacGeorge, Feng, & Burleson, 2012). This study focuses particularly on informational and tangible support that has been studied as core forms of social support (Cutrona & Suhr, 1992).

First, *informational support* consists of offers for ideas and actions, reframing of situations, and providing detailed facts, information, as well as resources. Hence it can assist problem solving (Cutrona & Russell, 1990), reduce work-related stress (MacGeorge, Samter, & Gillihan, 2005), and help management of uncertainty about health-related matters (Brashers, Neidig, & Goldsmith, 2004). Second, *tangible support* involves offers to assist others through the use of goods, services, time, energy, money, or other resources. As tangible support includes various types of concrete aids such as lending money or helping childcare, it can help promoting the quality of life (Gielen, McDonnell, Wu, O'Campo, & Faden, 2001).

Given these distinct forms of social support, individuals may rely on different sources to solicit and obtain needed support. For instance, people are likely to contact someone who they feel intimate with or trust to seek tangible support; whereas, they may talk to someone in higher social status when they want to secure access to important information. Although the different

types of support exchange networks are not necessarily mutually exclusive, examining the composition of each network can shed light on the nature of supportive relationships within a particular organization. Thus, the current study employs a social network approach to investigate the configuration of informational and tangible support networks and how they are related to other network properties.

The Social Network Approach to Social Support

As Wellman (1997) pointed out, the social network framework can be particularly beneficial for studying interactions within organizational contexts. First, the social network approach treats the membership and boundaries of a group as open questions; namely, individuals who belong to the same organization may constitute different types of networks and the membership of each network can vary. Thus, through the lens of social network theory, we can analyze individuals' support exchanges within different kinds of support networks. Second, by examining interactions of network members, we can detect structural patterns that shed light on the social structures associated with member characteristics and relationships. In doing so, this study aims to reveal a broader pattern that may explicate the configuration of voluntary organizational networks and members' support-exchange behaviors.

Specifically, this study examines the influences of structural (e.g., organizational hierarchy and network location) and individual (e.g., gender, age, income, and occupation) characteristics on supportive relationship formation within an immigrant church organization. The structure of social support networks can be explained by different network measures, and this study employs essential constructs such as degree and betweenness centralities. *Degree centrality*, which refers to the number of direct connections that an actor has with others in the network, provides an effective measure to capture the overall activity and popularity of a given

actor (Wasserman & Faust, 1994). *Betweenness centrality* is the extent to which an actor falls on the shortest paths between all pairs of other actors within the network. Betweenness centrality of an actor indicates the degree to which members can rely on the actor to make connections with others; it reflects the power and influence of the actor within the network (Freeman, 1979). In this study, we illustrate organizational members' overall involvement in support exchange networks utilizing these centrality measures; further, we test the relationships between centralities and individual/structural characteristics described below.

In the following sections, hypotheses are derived from prior scholarship. First, previous research on status differences and their impacts on centralities in the context of social support exchange are reviewed. Then, literatures on homophily are employed to explain the ways in which connections with similar/dissimilar others are associated with the formation of supportive ties. In doing so, this analysis aims to elucidate underlying patterns that indicate which factors play influential roles in social support exchange within immigrant organizational networks.

Status Differentials and Social Support

People in high status positions are more likely to have desirable resources such as wealth, power, and access to other networks (Cross & Cummings, 2004). One's social status can be determined by (a) socioeconomic status (SES) and (b) the individual's hierarchical position within an organization. Scholars have investigated the multifaceted influences of SES on our social lives. SES is a composite measure that encompasses economic status, typically measured by income; social status, measured by education; and work status, measured by occupation (Dutton & Levine, 1989). In general, people who have higher SES are likely to have greater access to social capital (i.e., resources embedded in social networks) and resources (Lin, 2001). For instance, Stefanone, Kwon, and Lackaff (2012) demonstrated that people who occupied

socially prestigious positions were most likely to receive higher quality instrumental support. Members of higher SES groups often have more social contacts, thus higher network centrality, than those of lower SES groups (Berkman & Syme, 1979). Also, a higher education status is associated with larger, and more geographically diverse social networks whereas a lower education status is linked to a higher geographic proximity of contacts (Ajroush, Blandon, & Antonucci, 2005). People with higher SES have better access to both financial resources and coping resources, which leads to differential vulnerability to adverse life situations; in particular, a lower education and occupational status is significantly connected to vulnerability to stressful events (McLeod & Kessler, 1990). Similarly, Adler et al. (1994) argue that SES can affect personal health outcomes.

Drawing on this prior scholarship, we propose that the members of an immigrant church are more likely to turn to those who have higher SES when they need to solicit various kinds of social support. Especially in ethnic minority or immigrant communities, where members may suffer from lack of social capital, having access to and receiving help from people with higher SES can be especially important. As an effective support-seeking strategy, people will contact others who have a higher social status to solve problems, cope with difficult situations, and obtain quality information. Thus, we posit that the organizational members who have higher SES will occupy more central positions within support-seeking networks due to being sought out more by members within the organization. This leads to the following hypotheses:

H1a. Organizational members' socioeconomic status is positively associated with their degree and betweenness centrality centrality within the informational support network.

H1b. Organizational members' socioeconomic status is positively associated with their degree and betweenness centrality centrality within the tangible support network.

In addition to individuals' SES, hierarchical positions within an immigrant church organization affect network structure and social support exchange due to status and role differentials. Hierarchical power, which is also referred to as legitimate power, is based on formal structures and authority within an organization (French & Raven, 1959). Organizational members in higher positions can provide resources to other members and also mobilize resources from them through formal and informal requests. Particularly in the context of a church organization, those who serve official staff positions such as deacons, exhorters, and elders are expected to provide services to members such as spiritual guidance, emotional support, and even tangible help (Taylor & Chatters, 1988; detailed descriptions about each position is provided in the Method section of this paper). Research on Korean immigrant churches particularly has reported that those who served staff positions in their ethnic churches had longer experiences of immigration, higher level of education, and were more satisfied in terms of mental health (Hurh & Kim, 1990). Therefore, members who have higher status positions within the church organization are likely to occupy more central positions in terms of both degree and betweenness in support-exchange networks. These leaders could be sought out by more members in terms of support provision (i.e., degree) or serve as mediators between those who need various kinds of social support (i.e., betweenness).

Contrary to the case of for-profit organizations where higher status individuals might not be very accessible due to hierarchical constraints, those who occupy staff positions in nonprofit and volunteer organizations may be serving those positions partially due to their available resources such as time, money, and high commitment to the mission of the organization (Hurh & Kim, 1990). Kramer (2006) explains, leaders of volunteer groups have the tasks of providing direction, conveying a vision for the organization, and coordinating members' activities.

Whereas individuals have to inevitably compete with one another to achieve higher positions within profit-driven organizations, staff positions within church organizations have to be volunteered, and leaders are expected to "serve," not "rule" other members (Crist-Houran, 1996).

Research on church support networks shows that involvement in church networks is also related to higher levels of received assistance (Chatters et al., 2002; Hurh & Kim, 1990). Therefore, members who are highly involved in the church such as those serving staff positions might also receive high levels of social support. Based on the previous research findings on church support networks and members' organizational positions, we hypothesize the relationship between network centralities and organizational hierarchies as follows:

H2a. Organizational members' hierarchical position within the church organization is positively associated with their degree and betweenness centrality in the informational support network.

H2b. Organizational members' hierarchical position within the church organization is positively associated with their degree and betweenness centrality in the tangible support network.

Homophily and Social Support

Homophily is a basis of human relationships and social support has been understood as a fundamental motivation for creating and maintaining communication networks (Monge & Contractor, 2003). *Homophily* is the principle that contact between similar individuals occurs at a higher rate than contact among dissimilar people (McPherson & Smith-Lovin, 1987; McPherson, Smith-Lovin, & Cook, 2001). Similar others are particularly persuasive in determining adoption of new products, norms, and ideas (i.e., diffusion of innovation; Rogers, 2003).

The role of homophily has been extensively studied in the context of social support exchange. Homophily greatly influences individuals' support-seeking behaviors because people tend to solicit social support from similar others who may have shared contexts and mutual understanding (Preece, 1999; Wright, 2000). Furthermore, people often consider support received from similar others to be more effective and beneficial than support from dissimilar others (Cawyer & Smith-Dupre, 1995; Cline, 1999). Strong or homophilous ties are more important conduits of social support than weak or heterophilous ties (Haines, Hurlbert, & Beggs, 1996; Wellman, 1992). Strong, homophilous, and kinship ties are primary sources of social support across different populations (Kim, 2014; Lin, Woelfel, & Light, 1985; Wellman & Wortley, 1990).

A substantial body of research has investigated the influence of age and gender homophily on communication networks within organizations. Members of voluntary organizations were more likely to recruit others similar to their age; in addition, members in the same age groups were more densely connected within the organization (Liedka, 1991). In government organizations, many advice and friendship cliques were comprised of the same gender (Moore, 1992). Recent analysis of large email data from a high-tech firm revealed significant patterns of gender homophily in dyadic communication network, showing notably strong homophily between women (Kleinbaum, Stuart, & Tushman, 2013). Ibarra (1992) also demonstrated that gender homophily was evident in the communication networks of an advertising agency; in particular, women were more likely to contact other women for social support exchange. Organizational members are likely to solicit help from the same gender group due to shared perspectives and communication styles (Rice, Collins-Jarvis, & Zydney-Walker, 1999). Furthermore, when organizational members share more traits, they are more likely to

form both instrumental and expressive ties (Yuan & Gay, 2006). Extending the previous work, we suggest that organizational members' support exchange networks are more likely to contain homophilous ties in terms of both gender and age. Hence, we propose the following hypotheses:

H3a. Organizational members are more likely to exchange tangible support with homophilous ties in terms of gender.

H3b. Organizational members are more likely to exchange tangible support with homophilous ties in terms of age.

Contrary to the case of tangible support, scholars have provided evidence that indicates people are more likely to contact weak or heterophilous ties when they are in need of informational support. Whereas individuals prefer contacting intimate friends or people who have similar experiences when they have to request large services, it is likely that they do not feel such pressures when searching for information. Indeed, weak ties are more effective at giving informational support rather than tangible or even emotional support (Granovetter, 1983; Kavanaugh, Reese, Carroll, & Rosson, 2005). Moreover, homogeneity of networks can limit the diversity of information (Wright, Rains, & Banas, 2010); thus, individuals seek supportive relationships with their network members who have more and different informational resources (Wellman & Wortley, 1990).

Given that diverse networks are more conducive to information exchange (Reagans & McEvily, 2003), we argue that organizational members will select heterophilous ties when they look for new information. When discussing the possible impact of heterophily on innovation adoption, Rogers (2003) argues that people can be persuaded/influenced more effectively by those who are different from them; for example, when learning about new ideas, products, or social practices, people look up to innovators and early adopters who have higher socioeconomic

status and are better connected in a social network. Given the importance of network diversity in exchange of informational support, we hypothesize:

H4a. Organizational members are more likely to exchange informational support with heterophilous ties than with homophilous ties in terms of gender.

H4b. Organizational members are more likely to exchange informational support with heterophilous ties than from homophilous ties in terms of age.

Method

To test our hypotheses, we utilized network data collected from a member survey of a Korean immigrant church organization. The church was located in suburban New Jersey, United States, which is one of the states most densely populated by Korean immigrants along with California, New York, Georgia, Illinois, and Texas. The following section briefly describes the process of data collection and analysis.

Data Collection

Based on the most updated member registry, a survey asking church members' social network of informational and tangible support was distributed by mail. Although mail-in surveys could have lower response rate than that of online surveys, the current research did not use online surveys considering older-age members of the church who may lack proficiency or access to Internet surveys. Each member was asked in the survey to provide names and demographics of people from whom they seek "information needed for daily life," and tangible help such as, "getting a ride, borrowing money, and asking for babysitting." Such brief measures were employed to reduce participant fatigue and encourage survey completion. The survey was delivered between November 2011 and January 2012. The response rate by September 2012, when data collection ended, was about 40% ($N = 178$) out of 450 registered members.

Sample. Eighty men (45.6%) and ninety-six women (54.3%) participated in the survey (two participants did not report gender) and participants' age ranged from 21 to 87 ($M = 52.0$, $SD = 13.5$). Most participants were first-generation immigrants born in Korea ($n = 175$, 98.3%), and their occupations were somewhat evenly distributed among professionals (e.g., lawyer, doctor, accountant; 31.3%), small business owners (e.g., laundry shop, nail salon, grocery; 38.6%), and the unemployed (e.g., students, housekeeper, retired; 30.1%). The distribution of monthly income level was segmented among those who reported making less than $2500 per month (31.9%), $2500-5500 per month (34.4%), and more than $5500 per month (33.7%). The Korean immigrant participants' education level was relatively high with over 75% reporting as college graduate or higher. Many participants (88.1%) in the sample were married. There were 30 regular members (16.8%), and 110 deacons (61.8%), 27 exhorters (15.2%), 5 elders (2.8%), and 2 pastors (1.1%) who consisted of official positions in the church. Four (2.2%) pastors' wives also participated in the survey.

Among various leadership positions in this Protestant church, deacons are the lowest in the hierarchy; regular members have to receive a certain amount of education about what it means to be a deacon at church and commit to the duty of serving a church community if they become a deacon. Among deacons who served the church for an extended period of time (e.g., 5-10 years), some deacons are elected as exhorters, who can teach the Bible and lead small groups in the church. Elders are the highest and most honored position at the church and only a few exhorters eventually become elders by an election among church members. Pastors are the clergy whose job is to lead services, give sermons, and provide spiritual help to church members.

Network construction. Based on the information provided by participants in the survey, the network of informational and tangible support of the church was constructed. This represents

an ego-network approach, but participants' named alters, who were also registered as church members, could be identified using the member registry. A total of 289 actors were identified during this process. Using the demographic information of participants and their alters, individual attributes (i.e., age, gender, SES, and staff positions) were also identified for hypothesis testing. Thus, there were 161 women (55.7%) and 128 men (44.3%) in the final network, instead of the 80 and 96 respondents. Participants were classified into five different age groups in order to explore the age homophily in the three networks: a) younger than 35 ($n = 51$; 17.6%); b) 35 to 44 ($n = 59$; 20.4%); c) 45 to 54 ($n = 87$; 30.1%); d) 55 to 64 ($n = 49$; 17.0%); and e) older than 65 years ($n = 43$; 14.9%).

Analysis. The numbers of edges (i.e., ties) in each network and the two types of centrality scores (e.g., degree and betweenness centrality) for individual actors were obtained from UCINET's (Borgatti, Everett, & Freeman, 2002) functions. To examine density (i.e., how many ties were actually formed given the possible number of all ties; Chang, 2009) of each network, a cohesion analysis was conducted. Analyses of variance (ANOVAs) were utilized to test hypotheses related to SES, hierarchical positions, and centralities (i.e., H1 and H2). In order to explore both gender and age homophily in each type of support network, exponential random graph modeling (ERGM) available through the statistical program, R's Statnet (Handcock, Hunter, Butts, Goodreau, & Morris, 2003) was performed (for H3 and H4) using Markov Chain Monte Carlo (MCMC) maximum likelihood estimation. ERG models are also known as $p*$ (p-star) class and are explained in great detail elsewhere in the literature (Handcock et al., 2008; Robins, Pattison, Kalish, & Lusher, 2007). Improved estimation methods in $p*$ models allow hypothesis testing and generalization from network data above and beyond the descriptive level of analysis (Contractor, Wasserman, & Faust, 2006).

The network data contained links involving 64.2% of church members (289 out of 450), with a total survey response rate of 40% ($N = 178$). Therefore, we do not claim to analyze a full-network, but data from members in every possible position in the organization is sufficiently presented. A chi-square goodness-of-fit test suggests the collected sample does not differ significantly from the ratio of positions reported in the registry, X^2 (2, $N = 178$) = 1.58, $p = .46$. The effects of missing data in social networks have been discussed elsewhere (Kossinets, 2006).

Results

Descriptions of Organizational Support Networks

The number of total ties in informational support network was 329 and 211 for tangible support network before symmetrizing ties. Thus, church members formed more ties to seek informational support than tangible support from other members. We expect this has to do with the extent of face threatening caused by asking for favor in social interactions (Brown & Levinson, 1999). Since people want to minimize the imposition on other's face, and providing daily information takes generally less effort and costs than giving tangible help to others, there might be more ties formed for seeking informational support among church members. In addition, the traditional social support literature has suggested that the effects of network density depend on the types of social support provided (Chang, 2009). For instance, more demanding assistance, such as delivery of chronic healthcare services, was provided more in high-density networks, and less demanding support, such as emotional aid, was provided in low-density networks (Wellman, 1992).

Although there were more ties in the informational support network and the average degree ($m_{degree} = 1.28$) was also higher than that of the tangible support network ($m_{degree} = 1.03$), the density of each network was approximately the same ($m_{density} = 0.005$) in our sample. The

result of cohesion analysis seemed partially due to the number of isolates (actors who are not connected to any others in the network) in each network. Specifically, even if the connected portion of each network was densely populated, a large number of isolates creates overall disconnection in the network inevitably suppressing the density value[1]. Therefore, density of a giant component (the portion of the network that remains intact after removing isolates) in each network was also calculated after symmetrizing ties; subsequently, the tangible support network's component was denser (0.031) with 186 ties (component $m_{degree} = 2.59$) than the informational support network's giant component which had a density of .008 with 292 ties (component $m_{degree} = 1.55$).

While network density did not vary across the complete networks that included isolates, when only the giant component was analyzed, members had more direct connections for exchanging tangible help, indicated by the higher average degree (i.e., 2.59). Thus, these networks resemble prior social support network data showing informational support networks have lower densities than tangible support networks, suggesting validity in our network construction (Chang, 2009). Table 1 summarizes and compares the results of cohesion analysis of the two networks.

[Insert Table 1 about here]

Members' SES and Network Centralities (H1s)

The first hypothesis proposed participants' socioeconomic status (SES) (including income, education, and occupation) leads to greater centralities in informational and tangible support network. Based on the results of ANOVA, this hypothesis was partially supported. Only degree centrality of informational support network was significantly influenced by the income

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[1] Components of a network are sub-networks that are connected within, but disconnected between sub-networks. If a network contains one or more "isolates," these actors are components (Hanneman & Riddle, 2005).

level, $F(2) = 3.55$, $p < .05$. Participants in the higher income level group (earning more than $5500 per month) tended to be more central ($M = .87$, $SD = .54$) in the informational support network than those in the lowest income group (earning less than $2500; $M = .55$, $SD = .58$).

There was no statistically significant difference identified when comparing centrality in the tangible support network across the three income-levels or occupation groups. The professional occupation group and the higher income group showed slightly higher scores of centrality compared to the other groups, but again, the difference was not statistically significant. The result was the same when an individual's SES score was calculated as a product of education, income, and occupation ($M = 7.83$, $SD = 5.27$, $Range = 1$ to 18). Only degree centrality of informational support network was significantly correlated with SES, $r = .23$, $p < .05$. Therefore, H1a was supported whereas H1b was not. This result suggests that members of the Korean immigrant church tend to seek information needed for daily life from members who earn higher income than others, but that such difference does not affect their exchange of tangible support resources.

Hierarchical Positions and Network Centralities (H2s)

Participants' official staff positions in the church organization were categorized into three groups: a) regular members ($n = 30$), b) deacons ($n = 110$), and c) higher positions such as elders and pastors ($n = 38$). Protestant churches have hierarchical systems with positions given to committed and long-tenure members. Although there are variations across denominations, a deacon is the first official position members can have, and among deacons who served the church for an extended period of time, members elect higher positions like exhorters and elders based on their pastors' recommendation. The election of higher positions in Korean churches is often a confirmation by members, not a competition between candidates.

The result of ANOVA, with the homogeneity of variances tested, indicated that there was a significant difference in betweenness centrality of informational support network among the three position groups, $F(2) = 3.46$, $p < .05$. A post-hoc test (i.e., Scheffe's) was performed to further examine group differences, which showed the group of deacons ($M = 2.04$, $SD = 1.31$) had a significantly higher betweenness centrality, $SE = .30$, $p < .05$, in informational support network than the group of regular members ($M = 1.30$, $SD = 1.25$). The group of elders and pastors showed a similar level of betweenness centrality ($M = 2.07$, $SD = 1.26$) with that of the deacons, but their difference from the regular members' was not statistically significant, $SE = .34$, $p = .08$. The result demonstrates that deacons of this church organization tended to occupy network positions of the shortest paths that fell "in between" people in their exchange of informational support. The difference in degree centrality of informational support network did not reach conventional levels of statistical significance, $F(2) = 2.91$, $p = .06$, despite the similar trend with the case of betweenness centrality. Therefore, H2a was partially supported.

The results of ANOVA support the distinction between the notion of degree and betweenness centrality because the group of deacons had a significantly higher betweenness than the group of regular members, but not degree centrality. It is notable that deacons might be able to actively brokerage members' information exchange using their network location (i.e., betweenness) rather than being the active provider/seeker (i.e., degree) of informational support. A visualization of the informational support network in terms of the organizational position and betweenness centrality is presented in Figure 1.1 Blue colored nodes represent deacons of the church and the size of each node represents the extent of betweenness centrality. In line with the result of ANOVA, the largest nodes in the informational support network are mostly blue reflecting deacons' central position in betweenness.

[Insert Figure 1.1 about here]

The result of ANOVA for the tangible support network, using Welch's procedure to correct for the violation of homogeneity of variance (Tomarken & Serlin, 1994), showed that the difference in betweenness centrality of the three positional groups was overall significant, $F(2, 55.31) = 3.34$, $p < .05$. However, the degree centrality was not. The Games-Howell post-hoc test comparing the betweenness centrality revealed marginal differences between the regular member group's ($M = 1.38$, $SD = 2.31$) and the deacon group's ($M = 2.62$, $SD = 2.80$) centrality, $SE = .54$, $p = .06$, and also between the regular members' and the group of elders/pastors' centrality ($M = 2.94$, $SD = 2.76$), $SE = .67$, $p = .06$. These ANOVA tests showed that the church members who had official positions tended to be in the shortest paths in tangible support exchange network. Thus, they could be helping members to identify sources of tangible support such as providing a ride, babysitting, or lending money. Church leaders may also introduce people to members who need resources. The insignificant difference of degree centrality could be interpreted that those with higher staff positions in the church did not necessarily provide or seek tangible support more actively than other members did. Therefore, H2b was partially supported.

Age and Gender Homophily in the Tangible Support Network (H3s)

Using exponential random graph modeling (ERGM), each network was estimated first with structural parameters such as edges, degrees, and geometrically weighted dyadwise shared partner (GWDSP) and edgewise shared partner (GWESP). These four parameters are most commonly considered structural factors that capture the probability of forming dyadic ties (i.e., edges), certain nodes being more popular or active than others (i.e., degrees), and tendency of sharing ties (GWDSP) and forming a cluster (i.e., GWESP). We symmetrized the network, which means the direction of ties was not considered when fitting the model. When there was at

least one tie formed between two actors, either sending or receiving, we considered that as a degree. Symmetrizing dyadic ties this way could over simplify the process of social support exchange because we do not consider whether a support exchange was reciprocated between actors and which actor might provide and receive more support resources than others. However, the focus of this study was on the influence of homophily and members' statuses on formation of support relationships, not necessarily on reciprocity of support exchange. Thus, symmetrized dataset can provide the broadest overview of social support exchange.

The third hypothesis of this study proposed church members exchange tangible support with homophilous ties in terms of gender (H3a) and age (H3b). The results of ERGM fitting showed that there was significant gender heterophily, which meant the Korean church members tended to exchange tangible support with the opposite gender more frequently than with the same gender members (see Model 4 in Table 2.1). Since exchanging tangible support such as borrowing money or getting a ride would impose a greater cost to others, relative to asking for informational support, participants might be exchanging tangible support mostly with their heterosexual spouses and family members. In order to test that, we attempted an additional analysis by removing all family ties (n = 124) in the dataset and remodeled the tangible support network (N = 62 ties). As a result, the parameter of gender homophily became positive (see Model 4 in Table 2.2), which signals the trend of homophily, but this trend was not statistically significant. Therefore, H3a was not supported. In both analyses, no significant age homophily was identified, meaning the church members were not more likely to exchange tangible support with members who are in the same age group with them than by chance, thus hypothesis 3b was rejected (Figure 1.2 visualizes the tangible support network without family ties).

[Insert Table 2.1 and 2.2 and Figure 1.2 about here]

The overall structure of the tangible support network was relatively sparse: there was neither an extremely popular/active actor nor centralization, but the parameter estimate indicating clustering effect (i.e., GWESP) was positively significant (see Table 2.1 for parameter estimates from an ERGM fitting of the tangible support network). The results mean the tangible support resources are more or less evenly distributed among various actors in the network, and actors do not necessarily reach widely but obtain the resource from local cliques. Finding this sparse network is somewhat contradictory to the notion of immigrant community network being densely knitted (Portes & Sensenbrenner, 1993). However, the result could be due to the number of missing responses from the full network survey and/or the nature of tangible resources being scarcer than informational support resources.

Age and Gender Heterophily in the Informational Support Network (H4s)

The last set of hypotheses of the present study proposed that organizational members exchange informational support with more heterophilous ties than with homophilous ones in terms of gender (H4a) and age groups (H4b). The ERGM procedure was the same with that of the previous hypotheses testing for the tangible support network: after the structural parameters of edges, degrees, GWDSP and GWESP were considered, family ties and organizational position attributes were entered when fitting a model of informational support network. The model indicated a negative and significant parameter of family ties, indicating participants did not necessarily exchange informational support with members who have family within the same church. More ties were formed between those who have family members and those who do not (see Model 2 in Table 3.1). When gender and age attributes were considered in ERGM, both parameters were negative, which would indicate heterophily, if they were statistically significant (see Model 4 and 5 in Table 3.1). However, those parameters were not statistically significant,

and did not significantly improve the model fit as was indicated by the non-significant changes in values of Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC). Therefore, H4a and H4b were not supported.

In order to control for the effect of family ties on homophily/heterophily more completely, we attempted an additional analysis by removing all family ties ($n = 194$) in the dataset and remodeled the informational support network ($N = 98$ ties). As a result, the parameter of both gender and age homophily became positive (see Model 3 and 4 in Table 3.2), which signaled the trend of homophily, but this trend was not statistically significant. Therefore, the results of both analyses, with or without family ties, did not support gender and age heterophily hypotheses in informational support network of Korean church members.

The results of network parameter estimation revealed that tie formation in the informational support network occurred relatively sparsely, indicated by the negative density parameter (see Table 3.1 and 3.2). The significant positive parameter estimates of degree (i.e., Degree (1) and Degree (2) in Table 3.1 and 3.2) could be interpreted that most members had at least one or two alters with whom they exchanged informational support. There was a significant likelihood of observing local clustering in the informational support network indicated by the positive GWESP parameter estimate when family ties were included in the network.

[Insert Table 3.1 and 3.2 about here]

In addition, goodness-of-fit of the model was tested with multiple diagnostics such as degree distribution, edgewise-shared partners, and minimum geodesic distance. The three graphs in Figure 2 illustrate the goodness-of-fit diagnostics, which showed the fitted model (i.e., Model 2 in Table 3.1) for the informational support network was acceptable as the solid line representing the actual data more or less fell in between the simulated range.

Discussion

Social support is not simply an act to be employed under stressful life conditions, but an ongoing process of negotiation among organizational members (Kedrowicz, 2013). Based on the important implications of social support on managing volunteers and their organizational commitment, we studied how members of a Korean immigrant church exchanged various kinds of social support with one another using a social network approach. The research findings shed light on the internal structuring of organizational support networks and diverse mechanisms of social selection in forming support exchange relationships. The results will be discussed with regards to their implications and connections to previous literature.

A cohesion analysis of both informational and tangible support networks showed that the two networks overall had a similar level of density. However, when the giant component (i.e., the largest connected portion) of each network was analyzed, the tangible support network was slightly denser than the informational support network. According to Marsden (1987), network density describes the concentration of interpersonal relationships and correlates with members' wellbeing and the availability of social support. More connections between individuals create tighter and denser structure, which in turn affects "normative pressures – both in terms of pressures to conform and the responsibility for support in time of need" (McPherson, Smith-Lovin, & Brashears, 2006, p. 357). Therefore, our findings related to network density suggest that Korean immigrant church members might feel a little more pressure and responsibility when exchanging tangible support with one another due to the tighter connections (i.e., more concentrated relationships) compared to exchanging informational support.

For the first two sets of hypotheses of this study, we examined those who occupied central positions in the two kinds of organizational support (i.e., informational and tangible

support) networks. Drawing on prior scholarship, we hypothesized that members with higher SES and hierarchical positions in the organization would be more central in support exchange networks. The results first revealed that members with higher SES were central in exchanging informational support based on degree but not betweenness. SES was not influential in the tangible support network.

This particular association between individuals' SES and their positions in the informational support network could originate from the distinctive nature of the informational resource. Whereas soliciting tangible support can be more face threatening to interacting partners given its cost (Brown & Levinson, 1999), asking for daily information carries fewer burdens. Culture might also play a role here as Brown and Levinson (1999) consider the seriousness of a face threatening action as a culturally dependent variable. Chang (2009) also notes that members of collectivistic and high-context communication cultures, like the Taiwanese (and Korean), may be hesitant to disclose personal feelings and needs, which in turn influences the type and expression of social support exchanged within an online support group of psychosis. Rains, Peterson, and Wright's (2015) meta-analysis of online social support research confirms that informational support is the most commonly identified, necessary, and easiest resource across various settings. Despite the nature of informational support, defined in the survey as mostly the exchange of factual information, such as where to find Korean restaurants or daycare facilities, it was notable that members with higher SES were more involved in such information exchange than those with lower SES. We speculate that Korean immigrant church members perceive members who earn higher income and have professional occupations as more capable of providing information needed in daily life.

As predicted by our hypotheses and previous studies, organizational members with hierarchical positions such as deacons, elders, and pastors in a church context were more central in social support exchange networks. The results illustrated that the group of elders/pastors in the Korean immigrant church were significantly more central than the group of regular members in terms of betweenness centrality in tangible support network. This result suggests that members with higher staff positions occupy a mediator/broker position that is indicated by their higher betweenness centrality in tangible support network. Being located in the shortest paths between members of the same organization implies a possibility of exerting control over interactions among members (Wasserman & Faust, 1994) and a unique form of interpersonal influence (Freeman, 1979).

In addition, the group of deacons also had a higher betweenness centrality than the group of regular members in the informational support network. Overall, this study showed that different positions in the church were distinctively associated with different kinds of support exchanged, which indicates that the organizational hierarchy strongly manifest even in informal social networks. The findings provide insights into fostering member engagement and management, especially for voluntary organizations. Specifically, the organization may need to encourage elders and pastors to engage more in providing various forms of social support including tangible aid.

Employing an advanced statistical method analyzing network data (i.e., ERGM), the current study examined whether gender and age homophily/heterophily were significant underlying mechanisms of selecting social support exchange partners. By fitting ERG models for each type of social support network, we tested whether actors' individual attributes (i.e., age and gender) explained the likelihood of members' tie formation when controlled for the effect of

structural mechanisms (e.g., edge, degree, dyadwise and edgewise shared partner). The results of model fitting revealed how organizational members select their social support exchange partners varied across each type of network and gender and age homophily were not the major determinants of social support exchange partner choices.

First, there was a significant gender heterophily observed in the tangible support network possibly due to members exchanging help between their heterosexual spouses. When family ties were removed from the sample and an additional ERGM was computed, the gender homophily term became positive but not statistically significant, which signals that homophily may be at work. The reduced sample may have lacked the power to examine this hypothesis since family ties consisted almost two thirds of the original sample. However, the age homophily term was still negative, though also insignificant. Lack of homophily in the tangible support network seemed to relate to the highest amount of face threat when asking for favors and its actual cost imposed on support providers. Thus, a complex set of biological and decision factors may be competing, and members of the Korean immigrant church might be exchanging tangible support such as borrowing money, getting a ride, or taking care of children, mostly with their heterosexual spouses (who are also members of the same organization).

The result of the first ERGM for the informational support network of the church organization revealed a significant heterophily in terms of family tie, but not for gender or age. Parameter estimates for gender and age were negative, as expected, though. When an additional ERGM was attempted after removing all the family ties from the sample, both gender and age parameter became positive, signaling "homophily" not "heterophily," but both parameters were not statistically significant. We expect the ethnic and religious culture might also have influenced how Korean immigrant church members exchanged informational support with the same gender

members. Traditionally, East-Asian culture, including Korean, has been associated with the Confucian ethics that teaches interactions between the opposite sexes (who are not spouses to each other) should be modest. Furthermore, Korean Protestant churches are also known for their socially conservative culture that prohibits premarital sex or homosexual marriage from being openly discussed or acknowledged in the church context. Therefore, the reason our hypothesis of gender heterophily in informational support network was not supported could be partially understood in the aforementioned cultural contexts.

All in all, our research findings revealed the complex nature of organizational support networks. The members of the Korean immigrant church chose various support exchange partners depending on the type of support resources involved. Most of the time, social selection (i.e., choice homophily) did not explain members' supportive tie formation above the structural mechanism of the network configuration. While our hypotheses testing on the effect of members' SES and hierarchical positions on their network centralities were supported more often than not, ERG modeling for the two types of networks made us think gender and age homophily might not be a primary social selection process of Korean immigrants' support exchange. Providing leaders with a bird's eyes view of social networks within their organizations should improve leaders' understanding of inner structuring of the organization comprised of members' social interactions. Certainly, this practice poses some ethical risks related to individual privacy (for a discussion, see Kadushin, 2012), but would also allow leaders to use such information to help those who may be in need (e.g., isolates in social networks). Leaders could use this information to emphasize the kind of social support most needed by members and strengthen organizational members' commitment by providing and channeling necessary support resources.

Limitations and Future Directions

A few limitations of this research are worth mentioning and those limitations suggest constructive directions for future research. First, the findings of this study may not represent the characteristics of the complete network of the organization, as the initial survey response rate was approximately 40%. Even when we tried to construct the whole network by adding members mentioned by others in the survey, the total number of actors ($N = 289$) was approximately 64% of the population. Thus, it is possible that our data underrepresent the density of organizational networks, the availability of social support within the church, and that there will be additional unexamined ties among members. In an effort to gain as many responses as possible, we collected data for almost an entire year; a comparison of demographics and major variables (e.g., network centralities) of our study between respondents who participated in the first three months and those who responded later identified no significant difference. A future study should adopt a more advanced technique of estimating missing data in network analysis (Huisman, 2009; Robins, Pattison, & Woolcock, 2004).

Also, this study employed cross-sectional data with only one type of ethnic volunteer organization; therefore, the results do not explain whether these networks sustain or change over time. Nonetheless, given that immigrant social networks remain relatively stable (Lubbers et al., 2010), our findings contain some generalizability at least across Korean immigrant churches of the similar sizes in the U.S. A follow-up study should consider examining other types of volunteer organizations possibly with other ethnic groups than Korean or mixed-ethnic groups.

Third, we utilized only two of several types of social support. For example, Cutrona and Suhr (1992) suggest support types including esteem, emotional, and network support in addition to tangible and informational support. It is not unusual to test only certain kinds of support to avoid survey fatigue (Rozzell et al., 2014). However, given that individuals may solicit different

types of social support from distinct groups (Wellman & Wortly, 1990), future research can investigate the characteristics of other support networks in voluntary contexts, immigrant communities, or religious organizations.

Based on our findings, we propose some future directions that may expand understanding of organizational support networks. First, future studies can benefit from analyzing directed network data in order to consider the effect of support-seeking and support-receiving in a given network separately. In doing so, researchers can differentiate organizational members who tend to provide more support (e.g., members with a higher out-degree centrality) and those who are more likely to receive support (e.g., members with a higher in-degree centrality). This may shed light on the nature of immigrant networks such as power, influence, or disparate access to resources. Second, given that organizational structures and group membership can affect tie formation, future research can test both models of induced homophily and choice homophily (McPherson & Smith-Lovin, 1987) if researchers gain data on subgroup compositions of the organization. Our findings suggest there might be induced homophily operating within the organization as most of our choice homophily hypotheses were rejected. Finally, interviews with the organizational members may complement the survey findings by offering richer explanations about the quality and meaning of social support. Qualitative findings will be particularly useful to make sense of how immigrants solicit support from their ethnic communities in times of need and how received support affect their quality of life and organizational commitment.

Conclusion

The present study examined the social support networks of Korean immigrants in the volunteer organizational context of a church. Results indicated that members' socioeconomic status (SES) and hierarchical position made differences in terms of degree and/or betweenness

centrality in informational and tangible support networks. SES was associated with degree centrality in the informational support network but not in the tangible support network. Hierarchical positions functioned differently across network types: for the informational support network, degree centrality was significantly related to higher positions; and for the tangible support network, betweenness centrality was significant. Gender and age homophily/heterophily explained little in the support network formation of Korean immigrant church members. In sum, our study contributes to the limited body of work on volunteer members' social interactions as well as network structure of volunteer organizations associated with specific ethnic and religious culture.

References

Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health. *American Psychologist, 49*(1), 15-24.

Ajrouch, K. J., Blandon, A. Y., & Antonucci, T. C. (2005). Social networks among men and women: The effects of age and socioeconomic status. *Journal of Gerontology, 60*(6), 311-317.

Berkman, L., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology, 109*, 186-204.

Borgatti, S. P., Everett, M. G., & Freeman, L. C. (2002). *Ucinet for Windows: Software for social network analysis.* Analytic Technologies.

Brashers, D., Neidig, J., & Goldsmith, D. (2004). Social support and the management of uncertainty for people living with HIV or AIDS. *Health Communication, 16*, 305-331.

Brown, P., & Levinson, S. C. (1999). Politeness: Some universals in language usage. In A. Jaworski, & N. Coupland (Eds.), *The discourse reader* (pp. 321-335). New York, NY: Routledge.

Burleson, B. R. (2003). Emotional support skills. In J. O. Greene & B. R. Burleson (Eds.), *Handbook of communication and social interaction skills* (pp. 551-594). Mahwah, NJ: Lawrence Erlbaum.

Burleson, B. R., Albrecht, T. L., & Sarason, I. G. (Eds.). (1994). *Communication of social support: Messages, interactions, relationships, and community*. Thousand Oaks, CA: Sage.

Cawyer, C. S., & Smith-Dupre, A. (1995). Communicating social support: Identifying supportive

    episodes in an HIV/AIDS support group. *Communication Quarterly, 43*, 243-258.

Chang, H-I. (2009). Online supportive interactions: Using a network approach to examine

    communication patterns within a psychosis social support group in Taiwan. *Journal of*

    the American Society for Information Science and Technology, 60, 1504-1518. doi:

    10.1002/asi.21070

Chatters, L. M., Taylor, R. J., Lincoln, K. D., & Schroepfer, T. (2002). Patterns of informal

    support from family and church members among African Americans. *Journal of Black*

    Studies, 33, 66-85.

Crist-Houran, M. (1996). Efficacy of volunteerism for role-loss depression: A complement to

    Weinstein et al. *Psychological Reports*, *79*, 736–738.

Cline, R. J. (1999). Communication within social support groups. In L. R. Frey, D. S. Gouran, &

    M. S. Poole (Eds.), *Handbook of group communication theory and research* (pp. 516-

    538). Thousand Oaks, CA: Sage.

Contractor, N., Wasserman, S., Faust, K. (2006). Testing multi-theoretical multilevel hypotheses

    about organizational networks: An analytic framework and empirical example. *Academy*

    of Management Journal, 31, 681–703.

Cross, R., & Cummings, J. N. (2004). Tie and network correlates of individual performance in

    knowledge-intensive work. *The Academy of Management Journal, 47*(6), 928-937.

Cutrona, C. E., & Russell, D. W. (1990). Type of social support and specific stress: Toward a

    theory of optimal matching. In B. R. Sarason, I. G. Sarason, & G. R Pierce (Eds.), *Social*

    support: An interactional view (pp. 319-366). New York, NY: John Wiley & Sons.

Cutrona, C. E., & Suhr, J. A. (1992). Controllability of stressful events and satisfaction with

  spouse support behaviors. *Communication Research, 19*, 154-174. doi:

  10.1177/009365092019002002

Dutton, D. B., Levine, S. (1989). Overview, methodological critique, and reformulation. In J. P.

  Bunker, D. S. Gomby, & B. H. Kehrer (Eds.), *Pathways to health* (pp. 29-69). Menlo

  Park, CA: The Henry J. Kaiser Family Foundation.

Freeman, L. C. (1979). Centrality in social networks: Conceptual clarification. *Social Networks,

  1*, 215-239.

French, J. R. P., & Raven, B. (1959). Bases of social power. In D. Cartwright (Ed.), *Studies in

  social power* (pp. 150-167). Ann Arbor, MI: University of Michigan Press.

Gielen, A. C., McDonnell, K. A., Wu, A. W., O'Campo, P., & Faden, R. (2001). Quality of life

  among women living with HIV: The importance of violence, social support, and self care

  behaviors. *Social Science & Medicine, 52*(2), 315-322.

Goodreau, S. M, Handcock, M.S., Hunter, D.R., Butts, C.T., & Morris, M. (2008). A statnet

  tutorial, *Journal of Statistical Software*, 24. 1-27. Retrieved from

  http://www.jstatsoft.org/v24/i09

Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *Sociological

  Theory*, *1*, 201–233.

Haines, V. A., Hurlbert, J. S., & Beggs, J. J. (1996). Exploring the determinants of support

  provision: Provider characteristics, personal networks, community contexts, and support

  following life events. *Journal of Health and Social Behavior, 37*(3), 252-264.

Handcock, M.S., Hunter, D. R., Butts, C. T., Goodreau, S. M., & Morris, M. (2003). statnet: Software tools for the statistical modeling of network data. Retrieved from http://statnetproject.org.

Handcock, M.S., Hunter, D.R., Butts, C.T., Goodreau, S.M., & Morris, M. (2008). statnet: Software tools for the representation, visualization, analysis and simulation of network data. *Journal of Statistical Software, 24*(1). Retrieved from http://www.jstatsoft.org/v24/i01/.

Hanneman, R. A., & Riddle, M. (2005). *Introduction to social network methods.* Riverside, CA: University of California, Riverside. Retrieved from http://faculty.ucr.edu/~hanneman/

Huisman, M. (2009). Imputation of missing network data: some simple procedures. *Journal of Social Structure*, *10*, 1–29.

Hurh, W. M., & Kim, K. C. (1990). Religious participation of Korean immigrants in the United States. *Journal for the Scientific Study of Religion*, *29*(1), 19–34.

Ibarra, H. (1992). Homophily and differential returns: Sex differences in network structure and access in an advertising firm. *Administrative Science Quarterly, 37*, 422-447.

Kadushin, C. (2012). *Understanding social networks: Theories, concepts, and findings.* Oxford University Press.

Kavanaugh, A. L., Reese, D. D., Carroll, J. M., & Rosson, M. B. (2005). Weak ties in networked communities. *The Information Society, 21*(2), 119-131.

Kedrowicz, A. A. (2013). Supporting the supporters: Implications for organizational commitment. In M. W. Kramer, L. K. Lewis, & L. M. Gossett (Eds.), *Volunteering and communication: Studies from multiple contexts* (pp. 107-127). New York, NY: Peter Lang Publishing, Inc.

Kim, H. (2014). Enacted social support on social media and subjective well-being. *International Journal of Communication, 8*, 2201-2221.

Kim, H., & McKenry, P. (1998). Social networks and support: A comparison of African Americans, Asian Americans, Caucasians, and Hispanics. *Journal of Comparative Family Studies, 29*, 313-334.

Kleinbaum, A. M., Stuart, T. E., & Tushman, M. L. (2013). Discretion within constraint: Homophily and structure in a formal organization. *Organization Science, 24*, 1316-1336.

Kossinets, G. (2006). Effects of missing data in social networks. *Social Networks*, *28*, 247–268.

Kramer, M. W. (2006). Shared leadership in a community theater group: Filling the leadership role. *Journal of Applied Communication Research*, *34*(2), 141–162.

Kumar, S., Calvo, R., Avendano, M., Sivaramakrishnan, K., & Berkman, L. F. (2012). Social support, volunteering, and health around the world: Cross-national evidence from 139 countries. *Social Science & Medicine, 74*, 696-706.

Leenders, R. T. A. J. (1996). Evolution of friendship and best friendship choices. *The Journal of Mathematical Sociology, 21*, 133-148.

Lewis, L. K. (2013). An introduction to volunteers. In M. W. Kramer, L. K. Lewis, & L. M. Gossett (Eds.), *Volunteering and communication: Studies from multiple contexts* (pp. 1-22). New York, NY: Peter Lang Publishing, Inc.

Liedka, R. V. (1991). Who do you know in the group? Location of organizations in interpersonal networks. *Social Forces, 70*, 455-474.

Lin, N. (2001). *Social capital: A theory of social structure and action*. Cambridge, MA: Cambridge University Press.

Lin, N., Woelfel, M. W., & Light, S. C. (1985). The buffering effect of social support subsequent to an important life event. *Journal of Health and Social Behavior, 26*, 247-263.

Lubbers, M. J., Molina, J. L., Lerner, J., Brandes, U., Avila, J., & McCarty, C. (2010). Longitudinal analysis of personal networks. The case of Argentinean migrants in Spain. *Social Networks, 32*, 91-104.

MacGeorge, E. L., Feng, B., & Burleson, B. R. (2012). Supportive Communication. In M. L. Knapp & J. A. Daly (Eds.), *The SAGE Handbook of Interpersonal Communication* (pp. 317-354). Thousand Oaks, CA: Sage Publications.

MacGeorge, E. L., Samter, W., & Gillihan, S. J. (2005). Academic stress, supportive communication, and health. *Communication Education, 54*(4), 365-372.

Marsden, P.V. (1987). Core discussion networks of Americans. *American Sociological Review, 52*, 122–131.

McLeod, J. D., & Kessler, R. C. (1990). Socioeconomic status differences in vulnerability to undesirable life events. *Journal of Health and Social Behavior, 31*(2), 162-172.

McPherson, J. M., & Smith-Lovin, L. (1987). Homophily in voluntary organizations: Status distance and the composition of face-to-face groups. *American Sociological Review, 52*(3), 370-379.

McPherson, J. M., Smith-Lovin, L., & Brashears, M.E. (2006). Social isolation in America: Changes in core discussion networks over two decades. *American Sociological Review, 71*, 353–375.

McPherson, J. M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology, 27*, 415-444.

Min, P. G. (1992). The structure and social functions of Korean immigrant churches in the United States. *International Migration Review, 26*, 1370-1394.

Monge, P. R., & Contractor, N. S. (2003). *Theories of Communication Networks*. New York, NY: Oxford University Press.

Moore, G. (1992). Gender and informal networks in state government. *Social Science Quarterly, 73*, 46-61.

Pew Research Center (2012, June 19). The rise of Asian Americans. *Social & Demographic Trends.* Retrieved from http://www.pewsocialtrends.org/2012/06/19/the-rise-of-asian-americans/2/

Portes, A., & Sensenbreneer, J. (1993). Embeddedness and imigration: Notes on the social determinants of economic action. *American Journal of Sociology, 98*, 1320-1350

Preece, J. (1999). Empathetic communities: Balancing emotional and factual communication. *Interacting with Computers: The Interdisciplinary Journal of Human-Computer Interaction, 12*, 63-77.

Putnam, R., & Campbell, D. E. (2010). *American grace: How religion divides and unites us.* New York, NY: Simon & Schuster.

Rains, S. A., Peterson, E., & Wright, K. B. (2015). Communicating social support in computer-mediated contexts among individuals coping with illness: A meta-analytic review of content analyses examining support messages shared online. *Communication Monographs, 82*(4), 403-430.

Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly, 48*(2), 240-267.

Rice, R. E., Collins-Jarvis, L., & Zydney-Walker, S. (1999). Individual and structural influences on information technology helping relationships. *Journal of Applied Communication Research, 27*, 285-309.

Robins, G., Pattison, P., Kalish, Y., & Lusher, D. (2007). An introduction to exponential random graph (*p**) models for social networks. *Social Networks, 29*, 173-191.

Robins, G., Pattison, P., & Woolcock, J. (2004). Missing data in networks: exponential random graph models for networks with non-respondents. *Social Networks, 26*, 257-283.

Rogers, E. M. (2003). *Diffusion of innovation*. 5th Edition. New York, NY: The Free Press.

Rozzell, B., Piercy, C. W., Carr, C. T., King, S., Lane, B. L., Tornes, M., ... & Wright, K. B. (2014). Notification pending: Online social support from close and nonclose relational ties via Facebook. *Computers in Human Behavior*, *38*, 272-280.

Segrin, C. (2003). Age moderates the relationships between social support and psychosocial problems. *Human Communication Research, 29*(3), 317-342.

Stefanone, M. A., Kwon, K. H., & Lackaff, D. (2012). Exploring the relationship between perceptions of social capital and enacted support online. *Journal of Computer-Mediated Communication, 17*, 451-466.

Stroebe, W., & Stroebe, M. (1996). The social psychology of social support. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 597-621). New York, NY: Guilford Press.

Taylor, R. J., & Chatters, L. M. (1988). Church members as a source of informal social support. *Review of Religious Research, 30*(2), 193-203.

Taylor, R. J., Chatters, L. M., Woodward, A. T., & Brown, E. (2013). Racial and ethnic differences in extended family, friendship, fictive kin and congregational informal support networks. *Family Relations, 62*(4), 609-624.

US Department of Labor (2014, February 25). Volunteering in the United States – 2013. Current Population Survey. Retrieved from http://www.bls.gov/news.release/volun.nr0.htm.

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications.* New York, NY: Cambridge University Press.

Tomarken, A. J., & Serlin, R. C. (1994). Comparison of ANOVA alternatives under variance heterogeneity and specific noncentrality structures. *Psychological Bulletin, 99*, 90-99.

Waldinger, R. (Ed.) (2001). *Strangers at the gates: New immigrants in urban America*. Berkeley, CA: University of California Press.

Wellman, B. (1992). Which types of ties and networks provide what kinds of social support? *Advances in Group Processes, 9*, 207-235.

Wellman, B. (1997). An electronic group is virtually a social network. In S. Kiesler (Ed.), *Culture of the Internet* (pp. 179-205). Hillsdale, NJ: Lawrence Erlbuam.

Wellman, B., & Wortley, S. (1990). Different strokes from different folks: Community ties and social support. *American Journal of Sociology, 96*, 558-88.

Wright, K. (2000). Perceptions of online support providers: An examination of perceived homophily, source credibility, communication and social support within online support groups. *Communication Quarterly, 48*(1), 44-59.

Wright, K., Rains, S., & Banas, J. (2010). Weak-tie support network preference and perceived life stress among participants in health-related, computer-mediated support groups. *Journal of Computer-Mediated Communication, 15*, 606-624.

Yuan, Y. C., & Gay, G. (2006). Homophily of network ties and bonding and bridging social

capital in computer-mediated distributed teams. *Journal of Computer-Mediated
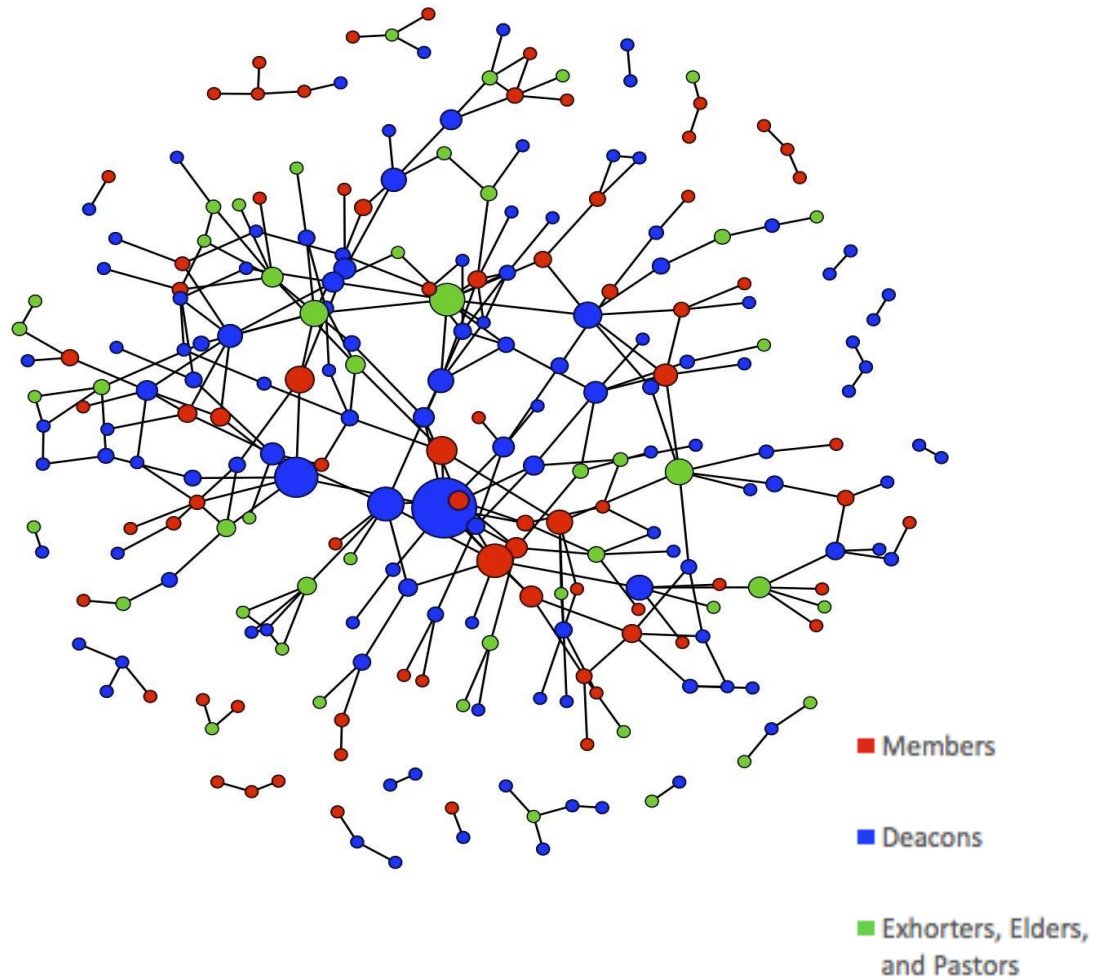
Communication, 11*, 1062-1084.

Figure 1.1. Visualization of the informational support network. The size of a node represents the actor's betweenness centrality and the bigger the node is, the more central the actor is. The total number of ties is 292.
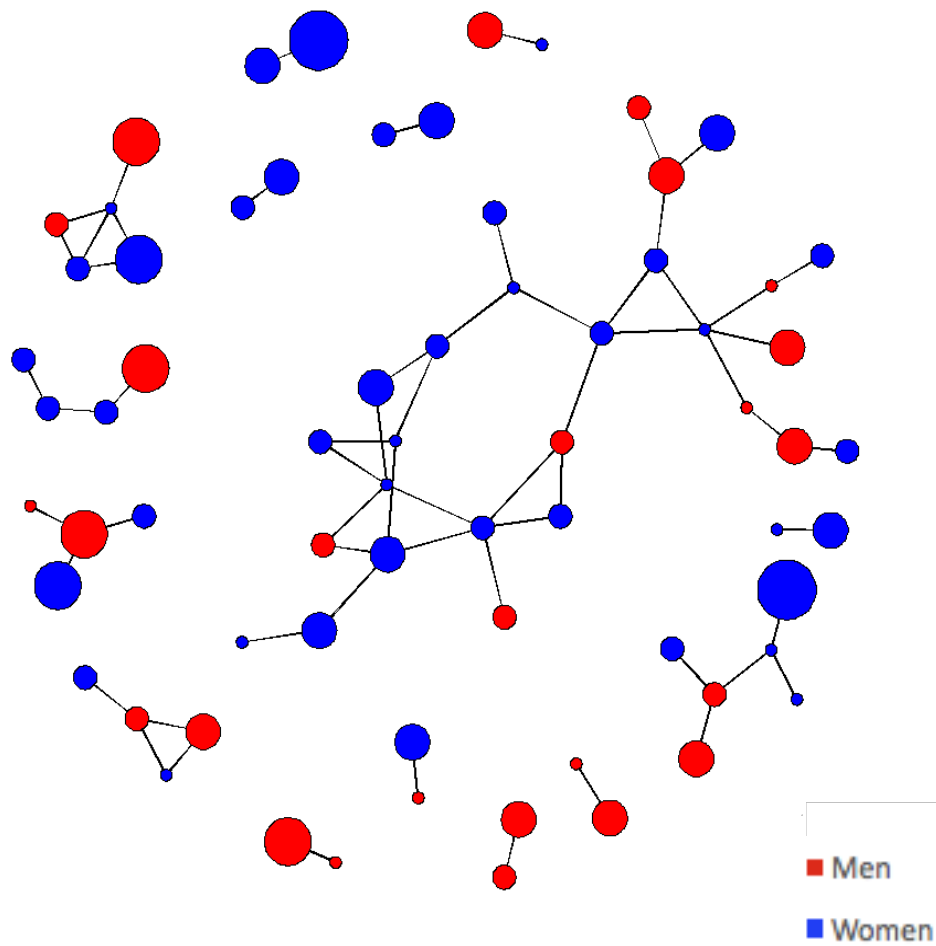
Figure 1.2. Visualization of the tangible support network without family ties. The size of a node represents the actor's age and the bigger the node, the older the actor is. The total number of ties is 62.
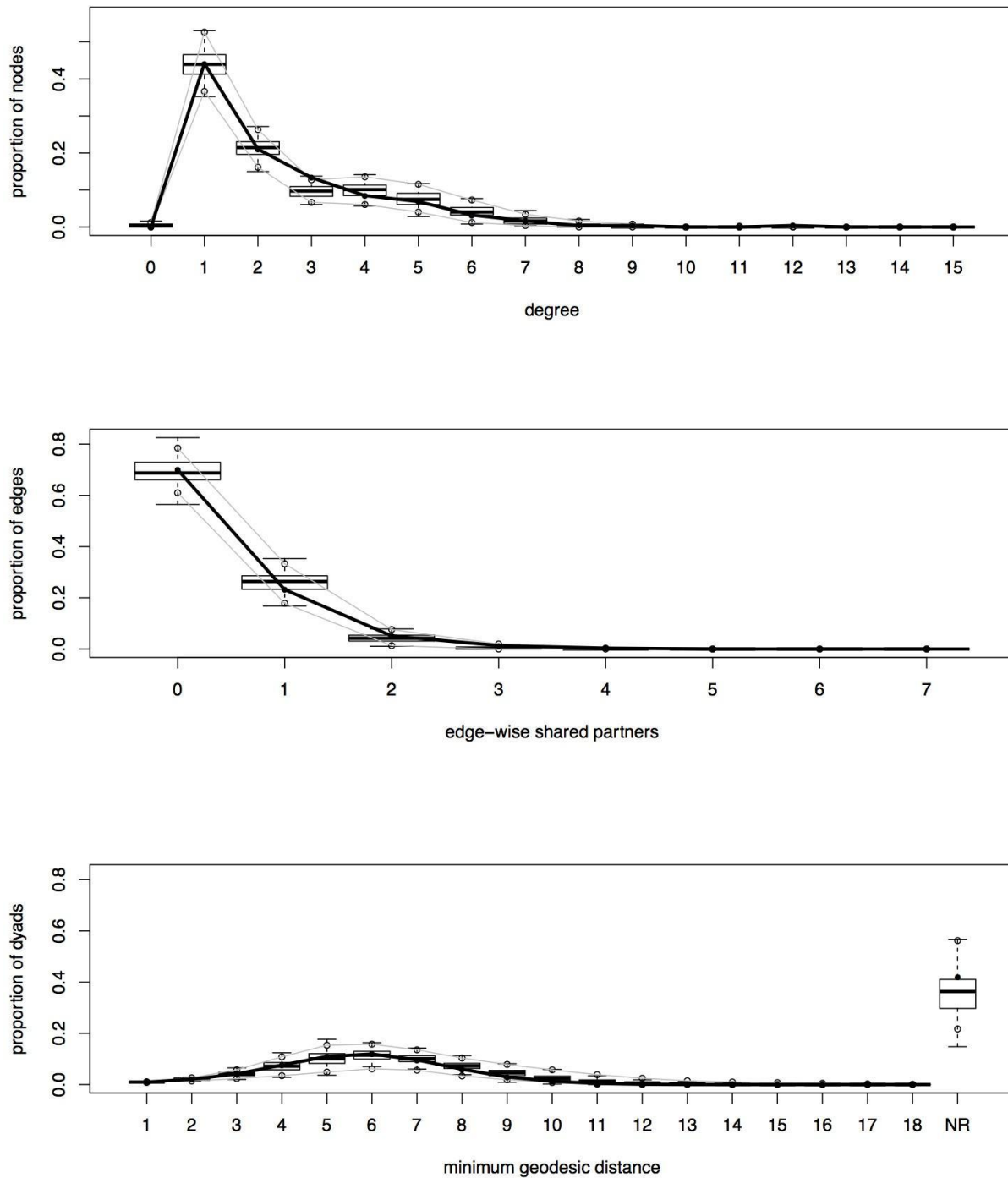
Figure 2. Goodness-of-fit diagnostics of ERG model fitting for the informational support network (Model 2 in Table 3.1). The thick line represents the observed network characteristics while the box plots refer to the distribution of characteristics of 100 simulated networks.

Table 1

Comparison of the Cohesion Level of the Networks

Cohesion Measures	Informational Support	Tangible Support
Overall Density	0.005	0.005
Average Degree	1.28	1.03
Giant Component's Density	0.008	.031
Average Degree within the Giant Component	1.55	2.59

Table 2.1

Results of ERGM for the Tangible Support Network

	Model 1	Model 2	Model 3	Model 4	Model 5
Edges	-3.40***	-3.29***	-3.30***	-3.22***	-3.06***
Degree(1)	1.73***	1.72***	1.73***	1.73***	1.72***
GWDSP	-0.22***	-0.22**	-0.22**	-0.22***	-0.24***
GWESP	1.30***	1.30***	1.30***	1.31***	1.30***
Family	NA	-0.11	-0.12	-0.11	-0.12
Position	NA	NA	0.17	0.16	0.16
Gender	NA	NA	NA	-0.41*	-0.41*
Age	NA	NA	NA	NA	-0.04
AIC	1913	1917	1921	1918	1922
BIC	1945	1963	1991	2004	2047

Note. * $p < .05$, **$p < .01$, *** $p < .001$.
GWDSP: Geometrically weighted dyadwise shared partner;
GWESP: Geometrically weighted edgewise shared partner.

Table 2.2

Results of ERGM for the Tangible Support Network (After Removing Family Ties)

	Model 1	Model 2	Model 3	Model 4	Model 5
Edges	-2.98***	0.01	0.91	0.52	0.62
Degree(1)	1.48***	2.17***	2.16***	2.15***	2.14***
GWDSP	NA	-0.66*	-0.71**	-0.72**	-0.76***
Position	NA	NA	-0.22	-0.22	-0.20
Gender	NA	NA	NA	0.18	0.17
Age	NA	NA	NA	NA	-0.03
AIC	549	540	541	544	549
BIC	561	557	576	590	623

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

GWDSP: Geometrically weighted dyad-wise shared partner

Table 3.1

Results of ERGM for the Informational Support Network

	Model 1	Model 2	Model 3	Model 4	Model 5
Edges	-2.79***	-2.41***	-2.50***	-2.46***	-2.38***
Degree(1)	2.75***	2.75***	2.74***	2.76***	2.74***
Degree(2)	1.13***	1.14***	1.13***	1.14***	1.14***
GWDSP	-0.23***	-0.23**	-0.23***	-0.23***	-0.24***
GWESP	1.16***	1.16***	1.16***	1.16***	1.16***
Family	NA	-0.33*	-0.33*	-0.33*	-0.33*
Position	NA	NA	0.06	0.06	0.07
Gender	NA	NA	NA	-0.07	-0.08
Age	NA	NA	NA	NA	-0.002
AIC	3084	3081	3085	3089	3097
BIC	3126	3139	3168	3189	3238

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

GWDSP: Geometrically weighted dyadwise shared partner;
GWESP: Geometrically weighted edgewise shared partner.

Table 3.2

Results of ERGM for the Informational Support Network (After Removing Family Ties)

	Model 1	Model 2	Model 3	Model 4
Edges	-0.39	-0.71	-0.79	-0.70
Degree(1)	3.85***	3.90***	3.88***	3.93**
Degree(2)	1.62**	1.64**	1.62**	1.65*
GWDSP	-0.36†	-0.38†	-0.38†	-0.23***
Position	NA	-0.13	-0.12	0.06
Gender	NA	NA	0.001	0.004
Age	NA	NA	NA	0.07
AIC	921	925	928	938
BIC	947	971	987	1029

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

GWDSP: Geometrically weighted dyadwise shared partner.