A Multilevel Perspective of Interpersonal Trust: Individual, Dyadic, and Cross-Level Predictors of Performance

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A Multilevel Perspective of Interpersonal Trust: Individual, Dyadic, and Cross-Level Predictors of Performance

Keywords: interpersonal trust, centrality, centralization, structural equivalence, individual performance, professional networking groups, multilevel
Abstract

While it is generally known that interpersonal trust facilitates individual functioning, few studies have examined the role of specific features of the interpersonal trust network -- individual, dyadic, third-party, and network-level features -- on individual performance. We adopt a multilevel perspective of interpersonal trust to examine how individuals’ performance is not only predicted by their individual-level centrality in the interpersonal trust network but also moderated, at the network level, by the overall centralized nature of that network. Further, we examine whether mutual trust relationships at the dyadic level, as well as shared trust ties to common third parties, can predict individuals’ performance. We test our hypotheses with 206 members in 15 professional networking groups and find that interpersonal trust operates at multiple levels to predict members’ performance in terms of generating income from business referrals. These findings provide theoretical and practical implications on how interpersonal trust relationships operate and can be managed for performance gains.
MULTILEVEL PERSPECTIVE OF TRUST

The importance of interpersonal trust, defined as the willingness of a trustor to be vulnerable to the actions of a trustee based on the expectation that the trustee will perform a particular action (Rousseau, Sitkin, Burt, & Camerer, 1998; Schoorman, Mayer, & Davis, 2007), has been firmly established in organizational research over recent decades. Multiple studies demonstrate that trust facilitates social functioning and individual action, yielding positive outcomes that include enhanced work attitudes, conflict resolution, communication, and work performance (see Colquitt, Scott, & LePine, 2007 and Dirks & Ferrin, 2001 for reviews). However, despite the fact that interpersonal trust comprises a relationship between two specific people (i.e., the trustor and a particular trustee) and can vary across different referents within the organization, prior research has primarily examined individuals’ trust toward a broad group of people (e.g., trust in coworkers as a group) or in one specific individual in the organization (e.g., trust in leader or manager) (Colquitt et al., 2007). While this research has enhanced our knowledge of trust, a more comprehensive examination of interpersonal trust should encompass an individual’s trust relationships with the various members that s/he works with, as well as the other members’ trust in each other. Doing so reflects not only the organizational reality that individuals have different degrees of trust in different targets, but also the fact that any two parties’ relationship is embedded within a larger configuration of trust relationships between other members, which could either facilitate or constrain the actions of the trustor and/or trustee.

A few studies have taken steps to examine the predictors of individuals’ trust relationships with various members (e.g., Chua, Ingram, & Morris, 2008; Chua, Morris, & Ingram, 2009; Ferrin, Dirks, & Shah, 2006; Lau and Liden, 2008; Sparrowe & Liden, 2005). However, research on the performance implications ensuing from such relationships is lacking, thereby raising questions as to whether one’s trust in another can, indeed, facilitate one or both
parties’ performance. For instance, while McAllister (1995) proposed that an individual’s trust in a peer will influence the trustor’s and trustee’s performance, his study provided support only for the former. Along similar lines but crossing organizational boundaries, Zaheer and colleagues’ (1998) study found that a buyer’s interpersonal trust in a supplier did not enhance the latter’s performance. Other studies, specifically in the context of professional networking groups, found trust effects on other individual outcomes such as cognitive and emotional changes in members but did not examine the effects on individual performance (Bergh, Thorgren, & Wincent, 2011; Peltier & Naidu, 2012). Thus, despite prior research documenting a positive link between trust and performance at the team level (e.g., Alge, Wiethoff, & Klein, 2003; Dirks, 1999), it remains unclear whether such performance benefits will translate to the individual and dyadic levels. Indeed, this lack of compelling evidence for the link between interpersonal trust and individual performance has led researchers to conclude that “the effects of trust on various workplace behaviors and performance outcomes are weaker and less consistent” compared to effects on workplace attitudes (Dirks & Ferrin, 2001, p. 455).

The present study addresses the limited research examining (1) individuals’ specific trust relationships with different members; and (2) the performance implications ensuing from such interpersonal trust relationships. Specifically, we investigate performance outcomes ensuing from interpersonal trust across multiple levels, given that interpersonal relationships can operate at various levels through different mechanisms (Kilduff & Tsai, 2005). We first examine the centrality of an individual’s position in the trust network (i.e., the individual level) by testing the performance outcomes of occupying a central position, and also taking into account the moderating role of network-level (or global-level) centralization, capturing the extent to which ties in a network are focused on one or few members rather than being equally distributed among
all members. Adopting this cross-level moderator model (Klein & Kozlowski, 2000) provides a more contextualized extension of prior findings relating to individual-level trust centrality as it tests whether performance benefits enjoyed by a highly central individual will vary depending on whether there are many or few other central figures in the overall network. In so doing, we recognize the fact that individuals are embedded within the larger context (Kozlowski & Klein, 2000) and the overall network structure can facilitate or impede the function of individual network features (Contractor, Wasserman, & Faust, 2006). Examining the cross-level performance implications of interpersonal trust also addresses the call for more research on the “study of the whole and the parts of social network simultaneously” (Kilduff & Brass, 2010, p. 325), and the study of cross-level pressures on individual actions (Brass, Galaskiewicz, Greve, & Tsai, 2004).

Because trust is fundamentally a phenomenon between two parties, it also operates at a more fine-grained, dyadic level to shape both parties’ behaviors toward each other. Thus, we also examine how a reciprocated form of dyadic trust, where a party trusts and is also trusted by another party, can yield performance benefits. Investigating this strong, reciprocated form of trust differs from, and contributes to, extant literature examining dyadic trust because prior works (e.g., Chua et al., 2008, 2009; Ferrin et al., 2006) have only looked at one party’s trust in another (i.e., a weaker form of trust), and examined only the antecedents, not consequences, of such unidirectional trust. By examining whether reciprocated trust relationships provide additional value over unidirectional trust in predicting performance, we offer a more comprehensive picture of the performance implications of dyadic trust relations.

Finally, just as we recognize the fact that individuals’ network positions are embedded within the larger network structure, we also acknowledge that dyads are embedded within
relationships among other actors in the network. In the trust literature, scholars have noted a skewed bias toward examining the psychological nature of trust without taking into account the social context surrounding the dyad (Ferrin et al., 2006; Kramer, 1996). Because “each individual typically participates in multiple dyadic relationships, and these relationships aggregate to form a complex social structure that surrounds each dyad and may influence the trust that forms between the members of the dyad” (Ferrin et al., 2006, pp. 870-871), a more comprehensive examination of trust needs to consider the third parties who are tied to these dyads. The network concept of structural equivalence, capturing the extent to which two parties have similar relationships to the same third parties, provides an extension to our dyadic-level investigation by taking into account the third parties with whom two people have similar trust relationships. Thus, structurally equivalent parties’ behaviors toward each other can be shaped both through an indirect mechanism – their trust of a third party -- and through their direct mutual trust relationship.

Overall, this study contributes to research in interpersonal trust in at least four ways. First, the findings add to the limited and equivocal body of knowledge on performance implications of interpersonal trust between two individuals, and provide more conclusive evidence as to whether such trust will facilitate one or both parties’ performance. Second, we offer a multi-level, multi-theoretical perspective of interpersonal trust effects on performance, thereby extending findings of prior studies that examined trust relationships at only one level and that implicitly assumed that the trust-to-performance linkage occurs only at that level. This single-level approach ignores the fact that social networks are complex systems with properties that exist at multiple levels, and provides a highly circumscribed view of this issue (Monge & Contractor, 2003). Our findings offer a more comprehensive perspective of how interpersonal
trust can operate across multiple levels, thereby highlighting the value of interpersonal trust in driving performance. From a practical standpoint, they also offer multiple avenues through which individuals can situate themselves in the trust network to augment their performance.

Third, we offer a more nuanced perspective to trust than currently found in the literature. We recognize that trust is situated within the larger social context, such that (a) the performance benefits deriving from an individual’s position in the trust network is contingent on the positions occupied by other members in the network; and (b) independent of the presence of a direct trust relationships between two parties, individual member connections with similar third-parties in the network can yield performance benefits. The former informs the limited research linking one’s trust centrality to performance (e.g., Sparrowe & Liden, 2005) by demonstrating the need to concurrently take into account other members’ centrality, while the latter provides a perspective that is under-examined in trust research.

Finally, we contribute to trust-based theory by explicating multiple theoretical mechanisms through which trust operates to facilitate performance. Because each network component operates through different psychological and social mechanisms (Monge & Contractor, 2003), we draw on the relevant theories in the appropriate domains to provide a multi-theoretical perspective. Specifically, we offer power-based arguments that view trust from an instrumental perspective as well as social exchange-based arguments that view trust from a relational perspective, and articulate how these two sets of arguments predict the performance benefits ensuing from interpersonal trust across multiple levels.

Given our focus on interpersonal trust and the ensuing performance implications, we chose a research context – that of professional networking groups – where trust relationships are instrumental in shaping one’s success, and also where the role of formal, organization-dictated
work relationships as alternative explanations for one’s performance can be minimized. These membership-based groups consist of small business owners and entrepreneurs, and are formed with the purpose of helping members seek referrals from as well as provide referrals to one another. However, other than formal weekly meetings, there are few institutionalized mechanisms, organizational mandates, or associated punishments that dictate or enforce such behaviors. Instead, members provide referrals voluntarily and without any organizational processes or assurances that the recipients will provide referrals in return. This then introduces an element of risk and underscores the relevance of interpersonal trust in driving members’ decision to provide referrals to others and their effectiveness in generating income from referrals provided to them (i.e., their performance).

**Theoretical Development and Hypotheses**

**Conceptualizing Performance and Trust in Professional Networking Groups**

A common conceptualization of job performance in the organizational literature includes performance aspects such as engaging in activities that directly affect the individual’s performance evaluation, and fulfilling responsibilities specified in the job description (Williams and Anderson, 1991). In the context of networking groups, however, members do not have a superior who conducts formal performance appraisals, or have formal job descriptions laid out for them. Such groups do not have a formal hierarchy or an appointed leader, and members interact as peers, akin to self-managed teams in traditional organizations (Kozlowski & Bell, 2003). Additionally, members’ ultimate goal of joining such groups is to obtain referrals from which to generate business income (Thompson, 2010). As such, individual performance in such groups is better and more accurately characterized as the extent to which a member meets his/her goal of generating business income from referrals (i.e., referral income). Whereas this
characterization of performance differs from more commonly used measures of job performance in organizations, it is consistent with a broader definition of performance as goal attainment (Erez & Kanfer, 1983; Locke, Shaw, Saari, & Latham, 1981), and is also aligned with commonly used financial measures of performance in the entrepreneurship literature.

We conceptualize trust as the extent to which a member (trustor) discusses confidential work-related issues with another (trustee), consistent with prior trust networks research (e.g., Lau & Liden, 2008; Sparrowe & Liden, 2005). This representation of trust is appropriate here for several reasons. First, prior research views sharing confidential information as a “representative form of trusting behavior” (Lau & Liden, p. 1133), in that it encompasses the two primary components of trust: the intention to accept vulnerability, and positive expectations of the trustee (Colquitt et al., 2007). Sharing confidential information involves the trustor being vulnerable (and accepting such vulnerability) to the trustee, in that the latter could inappropriately divulge such information to others. It also reflects the trustor’s positive expectation that the trustee will not harm him/her by doing that (Burt & Knez, 1996). Second, compared to perceptual measures of trust that ask people’s opinions (e.g., who they think is reliable) or intentions (e.g., who they would go to if they faced a problem), assessing people’s actual trusting behavior represents a more accurate and concrete representation of trust that is less speculative in nature.

**Performance Benefits from Individual’s Trust Centrality**

We contend that the position a member occupies in the overall trust network can play a role in his/her performance. From a power perspective, occupying a central position in the overall network of relationships has been commonly associated with power by virtue of others’ dependence on the central member to provide them with benefits such as timely information and/or access to other members (Emerson, 1972; Rowley, 1997). As such, network centrality has
been positively linked to a diverse set of attitudinal and performance outcomes, including job
satisfaction, commitment, power, job performance, citizenship behavior, and career advancement
(e.g., Brass, 1985a; Settoon & Mossholder, 2002; Sparrowe, Liden, Wayne, & Kraimer, 2001).
While the social networks approach offers multiple ways to conceptualize centrality-based power
(e.g., degree centrality based on the number of direct relationships a person has), we focus on the
concept of betweenness centrality, capturing the extent to which an individual is directly
connected only to those members who are not directly connected to each other. These individuals
are powerful in that they “can play the part of a ‘broker’ or ‘gatekeepers’ with a potential for
control over others” (Scott, 1991, p. 90), thereby facilitating or inhibiting connections between
others and mediating their access to resources (Freeman, Borgatti, & White, 1991).

Our focus on betweenness centrality is motivated by three reasons. First, to the extent that
information can aid one’s performance, it is access to unique and non-redundant information that
is more critical to success rather than the quantity of information (commonly reflected by degree
centrality). Because betweenness centrality captures one’s connections to people who are
themselves not directly connected with one another, it provides for a better measure of the
uniqueness of information and opportunities that an individual obtains from these contacts
(Brass, 1984; Krackhardt, 1990), compared to other centrality measures that only consider one’s
immediate relationships (e.g., degree centrality) or do not take into account whether one’s
contacts are connected or not (e.g., closeness centrality). Second, betweenness centrality also
takes into account the obtaining of unique information and opportunities by an individual’s
contacts. A betweenness-central figure’s ability to mediate and control the flow of unique
resources between two unconnected contacts is valuable in potentially yielding performance
benefits for these contacts as well, an aspect that is not captured by degree or closeness
centrality. Finally, betweenness centrality is advantageous in that it provides a more global assessment of an individual’s structural power, by virtue of the fact that it considers an individual’s direct relationships as well as those of his/her contacts.

Building on extant power-based perspectives of betweenness centrality (e.g., Brass, 1984; Freeman, 1977; Krackhardt, 1990), we contend that members with high betweenness centrality will enjoy performance advantages that derive from not only having direct access to network members, but also having indirect access to the contacts of these network members. Greater access to these direct and indirect contacts confers information benefits -- timely access to non-redundant information -- on the individual. The speed and uniqueness advantages can then be leveraged to generate more opportunities and, ultimately, referral income. Second, occupying a mediating network position in the trust network implies that the individual controls critical resources (Brass, 1985b; Freeman, 1977), in that the individual can decide what information to pass on to his/her other contacts, which relationships to connect, and when to do so. Because the individual controls others’ access to information, relationships, and opportunities, others are dependent on him/her and, consequently, are more inclined to cooperate and seek committed relations with such individuals (Cook and Emerson, 1978), including cultivating and generating appropriate referrals for them. Together, these reasons suggest that central members will enjoy performance advantages in the form of higher referral income because their position provides them not with, not only quick access to unique information that can be leveraged for performance benefits but also more power by virtue of others’ dependence on them.

H1: Individuals’ betweenness centrality is positively related to their performance (referral income).

Moderating Role of Overall Pattern of Trust Centrality (Network Centralization)
Whereas individual centrality is expected to shape one’s performance effectiveness (i.e., generate referral income), we contend that the broader network structure, in terms of how centralized or decentralized the overall network is, will moderate this linkage between individual centrality and performance. Network centralization is a concept at the global network level, capturing the variation in members’ centralities within a network (Freeman, 1979). Formally defined, network centralization is the extent to which ties in a network or group are focused on one or a few members, rather than being equally distributed among all members in the network (Scott, 1991; Wasserman & Faust, 1994). In the context of betweenness centralization in a trust network, a highly centralized network is one where only a few individuals are trusted by most of the other members who are unconnected to each other, and these few individuals have comparatively higher betweenness centrality scores than other members. In contrast, in a decentralized network, many individuals are trusted by an equal number of other unconnected members. Thus, members have similar betweenness centrality scores and there is less variation in members’ scores in a decentralized network than in a centralized one.¹

Research on network centralization has mostly focused on its role as a moderator, such as by accentuating the effects of centrality in an advice network (Wong, 2008), or by attenuating the effects of advice network density on team performance (Zhang & Peterson, 2011). These studies utilize arguments of visibility and social comparison that contend that central figures in a centralized network, rather than a decentralized network, are more visible and influential in comparison to other network members (Wong, 2008; Zohar & Tenne-Gazit, 2008). In the present context, the central figure in a betweenness-centralized trust network is the only one, or one of few members, who mediates the flow of information among other members and, thus, is also more visible. However, unlike earlier studies that show that high visibility is associated with
perceptions of high influence, we argue that the higher visibility of betweenness-central
members in centralized networks may reduce perceptions of their influence and, hence, their
performance.

First, the central figures can be perceived as pursuing their self-interest by brokering
information to accumulate benefits for themselves and sacrificing the collective interest of, and
the very reason for setting up, the group in the first place – to aid the performance of the group
and all its members (Monge and Contractor, 2003). This might induce the other members to
switch their focus from cooperating with the central figure to helping other members who are
perceived as less self-interested. The group norms literature provides robust evidence that
members perceived to be violating norms and expectations – in this case the expectation that all
members benefit financially from participating in the group, thereby ensuring the survival of the
whole group – are likely to be sanctioned (Feldman, 1984). In contrast, central figures in a less
centralized network are less visible and do not stand out as much in comparison, and thus are less
likely to be perceived as violating collective interests or group norms.

Second, the fact that the central figure controls the flow of critical resources suggests that
the figure can potentially become a bottleneck (Pich & Stout, 1998; Tsvetovat & Kouznetsov,
2011). In high betweenness-centralization networks, the central figure represents the only route,
or one of very few routes, through which information is exchanged between members. This
raises the possibility that information transmitted through this route may be delayed or
terminated due to constraints in the central figure’s capacity (e.g., time, cognitive ability) to
rapidly mediate information flow through all the paths concurrently. In turn, this compromises
other members’ ability to access critical information for their own performance benefits, thus
reducing their inclination to cooperate with the central figure. In a less centralized network, there
are more routes through which other members can access information to enhance their performance, thereby decreasing the likelihood that any one central figure will become a bottleneck.

Third, to the extent that the central figure in a highly centralized trust network is particularly visible and highly sought after by many members, this may cause other members to believe that the central figure is the recipient of many others’ help, and thus may not value or reciprocate the help and referrals that members provide to that central figure (Molm, Takahashi & Peterson, 2000). In contrast, in less centralized networks with multiple central figures, the fact that no single figure dominates the network may temper members’ perceptions that their help to these central figures is not valued and will not be reciprocated. Accordingly, members in less centralized networks may perceive greater future benefits in helping the central figures and are thus inclined to do so, compared to members in more centralized networks.

Overall, high network centralization attenuates the influence of centrality on performance because the central figure is perceived as less influential, which in turn arises from other members’ perceptions that the central figure (1) is violating group norms or not preserving the collective interest by pursuing his/her self-interests; (2) is a potential bottleneck as he/she is the sole, or one of few, mediator(s) of information exchange with other members; and (3) may not value and reciprocate their help and referrals given that the central figure receives these benefits from many others. Accordingly, other members are less inclined to offer performance benefits (i.e., provide income-generating referrals) to central figures in highly centralized networks.

H2: Network centralization moderates the positive relationship between individuals’ betweenness centrality and their performance (referral income), such that the relationship is stronger when network centralization is low rather than high.
Performance Benefits from Mutual Trust Relationships

At the dyadic level, we expect that trust relations between two specific people can shape both parties’ performance from both instrumental and relational standpoints. When an individual’s trust in another person is reciprocated, such that the other person also trusts the focal individual, it represents a particularly strong form of trust and relational power between the two, which will enhance both parties’ performance beyond the benefits ensuing from the unidirectional or unreciprocated relationship that one party has with the other.

From an instrumental perspective, power dependence theory suggests that interdependent relationships can act as a form of relational power and control (Cook & Emerson, 1978; Emerson, 1972), such that when two parties are dependent on each other, they become so strongly embedded in the relationship that leaving it becomes too costly, and both parties are essentially controlled by the relationship. Furthermore, in mutual trust relationships, the fact that both parties reveal confidential and sensitive information to each other serves to reinforce both parties’ relational embeddedness, which in turn has been linked to greater levels of affective commitment, cohesiveness, and identification with each other, and a more cooperative orientation and stronger affective bonds (Lawler & Yoon, 1996, Thye, Lawler & Yoon, 2011).

Scholars of social exchange and reciprocity also suggest that the value derived from reciprocity (i.e. giving a benefit in return for a benefit received) goes beyond the instrumental value of the benefit itself, such as the value of the information or resources being returned (Molm, Schaefer, Collett, 2007; Thibaut & Kelley, 1959). There is also a symbolic or relational value in reciprocity as it conveys one’s regard for the other by showing appreciation and care, and a willingness to invest in the relationship. Thus, mutual trust relationships are characterized by strong relationship investment and a focus on longer term, socio-emotional aspects of the
relationship (Shore, Tetrick, Lynch, & Barksdale, 2006). Such relational investment translates into greater efforts to cooperate with the other party, thereby enhancing the likelihood that a member will provide performance benefits to the other party.

**H3:** The strength of mutual trust relationship between two members is positively related to the performance benefits (referral income) that a member receives from the other member.

**Performance Benefits from Similar Third-Party Trust Relationships**

While the previous section examines the direct trust relationship between two members, here we examine the similarity of two members’ relationships with third parties in the network, independent of the presence or absence of a direct trust relationship between the two. This perspective recognizes that any two individuals are embedded with the larger microstructure of the network, such that their deeds and actions toward each other do not occur in a social vacuum. Instead, such behaviors can be observed or discovered by third parties to the relationship and, in turn, trigger larger-scale consequences.

The network concept of structural equivalence is useful not only in reflecting two members’ relational similarity in the network, but also in explaining the underlying mechanisms that compel both members to aid each other’s performance. Structural equivalence captures the extent to which two people occupy similar positions in the social structure and share a similar pattern of relations with other people in the network (Lorrain & White, 1971), independent of whether the two people have a direct relationship with each other. To illustrate, two individuals are considered to be structurally equivalent in the mutual trust network if both of them have mutual trust relationships with members A and B, and do not have such relationships with members C, D, and E. While structural equivalence has been traditionally examined in the
context of predicting contagion (i.e., two people’s similarity in attitudes and behaviors), we extend this concept to the context of interpersonal cooperation and performance benefits.

We present three reasons for why common third-party forces can motivate two members to aid each other’s performance. The first pertains to the increased opportunities to help a structurally equivalent counterpart. The common third parties who exchange confidential information with two structurally equivalent members (say, Ego and Alter) can, intentionally or otherwise, pass on information to Ego about the detailed needs or sensitive challenges that Alter has, and vice versa. As a result, these two members have a better understanding of the business issues faced by each other, and can better respond to these issues if they so choose.

The second reason pertains to the increased motivation to respond to a structural equivalent’s needs and cooperate with him/her, and involves the sense of shared identity and common fate that can ensue between two structural equivalents. Individuals who occupy similar roles in the larger network not only are exposed to similar information but also share similar experiences and are subject to similar norms and forces, which in turn facilitate a sense of shared identity, felt responsibility, and common fate with each other (Ferrin et al., 2006). Even though structural equivalence has been originally associated with greater competitive forces between the two focal members (Burt, 1987), subsequent works have since noted that “there is nothing in structural equivalence that necessarily leads to rivalry between structurally equivalent individuals” (Sparrowe & Liden, 2005, p. 518). Thus, from a relational standpoint, this sense of being in the same boat will increase one’s motivation to act on the previously discussed opportunities to help out a fellow counterpart.

Third, a member may be motivated to enhance a structural equivalent’s performance by virtue of the instrumental, reputation-based benefits that accrue with common third parties.
Researchers have noted that “trust is not merely an attribute of face-to-face dense relationships, but is affected by third party relations… and leads to the stability of one’s reputation in the community” (Kadushin, 2012, p. 61). Independent of the influence of a direct trust relationship between two parties, the reputational mechanisms inherent in common third-party connections could lead one to help the other party. Specifically, Ego’s action toward a structurally equivalent Alter, such as the provision of high-value referrals to Alter, will be known not only to Alter but also to their common third-party contacts, thereby enhancing Ego’s image in the eyes of the common third parties who, in turn, may be inclined to cooperate with Ego in the future (Ferrin et al., 2006; Raub & Weesie, 1990). As such, these third-party instrumental benefits provide the additional stimulus for structural equivalents to aid in each other’s performance. Together, these three reasons suggest that being connected by a common set of third parties will increase structural equivalents’ likelihood of facilitating each other’s performance.

H4: The extent to which two members have similar third-party trust relationships is positively related to the performance benefits (referral income) that a member receives from the other.

Method

Participants and Procedure

We invited all members of Business Networking International (BNI) groups in the Virginia chapter to participate in a survey administered online. BNI is the largest networking organization in the world with operations in over 50 countries and over 2,800 chapters, and each chapter consists of multiple membership-based groups. Members are small business owners from different business specializations ranging from landscaping to legal work, and the size of each group can vary from less than 10 to over 30 members. At the time of data collection, the chapter
had 39 networking groups, and the group sizes ranged from 8 to 37 members. Members in each group meet weekly to share referrals and resources with one another. In a typical meeting, while members spend some time on structured professional development and membership committee reporting, the bulk of their time is spent on having members take turns describing their ideal customers (e.g., an owner of a financial advising business may say “residential homeowners in zip code 12345”), and passing referrals to fellow group members. A referral consists of a potential client’s contact information after the referring member has corresponded with them. After obtaining the referral, the receiving member typically makes contact with the potential client, assesses their needs, provides the service, and receives payment. Thus, the more appropriate the referral provided by a member, the more likely that it will translate into referral income (i.e., enhanced performance) for the receiving member.

Of the 732 members across all 39 networking groups in the region that we studied, 360 (49.2% response rate) responded. This response rate was higher than the average response rate (34%) found in this type of online study (Shih & Fan, 2008). To ensure that we obtained an accurate picture of how complete groups functioned, following the recommendations by Kossinets (2006), we excluded respondents whose networking groups had fewer than half of their members respond. This resulted in our final sample of 206 respondents across 15 networking groups, with the average group-level response rate across the 15 groups being 83%. The average age of respondents was 46.4 years ($SD = 11.7$) and 50% were male. The average tenure of each respondent at his or her company was 8.29 years ($SD = 8.13$), and the average number of employees at these companies was 48.6 ($SD = 84.6$). Respondents came from a wide range of industries including business consulting, financial services, real estate, and construction.

**Measures**
To assess respondents’ level of trust in each of the other members in their networking group, we adopted the roster method (Marsden, 1990) by providing each respondent with a list of members in his/her group and asking him/her to indicate, on a scale of 0 (not at all) to 4 (very frequently), how often he/she approached each of the other members to discuss confidential work issues. This behavioral measure of trust is derived from and has been validated in prior studies (Lau & Liden, 2008; Sparrowe & Liden, 2005), and as explicated previously, is particularly relevant in the context of professional networking groups.

While using multiple items to measure a construct is preferable, the use of a single-item measure to assess one’s trust relationship with numerous other individuals is common in social network studies (e.g., Burt & Knez, 1996; Ferrin et al., 2006). Because of the considerable time and effort required for a respondent to answer the same trust question multiple times for the multiple members in his/her network, having respondents answer multiple-item trust questions is likely to engender fatigue and negative reactance. Further, researchers have demonstrated that single-item measures can be appropriate when the phenomenon being measured is sufficiently narrow or unambiguous (Sackett & Larson, 1990), and in the specific case of sociometric questions, research has shown that providing respondents with a roster of all network members can aid recall and yield reliable measures (Marsden, 1990).

**Centrality.** Following the approach recommended by Wasserman and Faust (1994) and used in prior studies (e.g., Mehra, Kilduff, & Brass, 2001), we assessed an individual’s betweenness centrality in the trust network using Freeman’s (1979) measure, which captures the degree to which an individual connects otherwise unconnected members in his/her network. The trust network in each group was arrived at by combining answers from all respondents within that group into an \( n \times n \) adjacency matrix, where \( n \) represented the group size (excluding non-
respondents) and each cell value $X_{ij}$ represented how much a member $i$ trusted another member $j$.

Because our final sample comprised 15 groups, we arrived at 15 adjacency matrices. A respondent’s betweenness centrality in his/her group was then computed by aggregating the proportion of times in which the respondent lay on the shortest path between every other pair of members. To account for differences in group size, we used the normalized betweenness centrality score, which expressed betweenness as a percentage of the maximum possible score in that group (Borgatti, Everett, & Freeman, 2002).

**Network centralization.** Network centralization measures the degree to which individuals are equally central in a network, that is, whether only a few members, rather than many, occupy a central position in the network. In the context of betweenness centrality, the centralization measure assesses the variation in the betweenness centrality of individual members by aggregating the degree to which each member’s betweenness centrality score deviated from the maximum score in the network, and then dividing this aggregate by the maximum score (Borgatti et al., 2002). This centralization measure can range from 0 (indicating that the betweenness centrality scores of all members are equal) to 1 (indicating that there is only one member who falls between the shortest paths connecting all other pairs of members) (Freeman, 1977).

**Mutual trust relationship.** To obtain the mutual trust relationship between two respondents, $i$ and $j$, we had to combine member $i$’s trust in member $j$ (represented by cell value $X_{ij}$ in the trust adjacency matrix) with member $j$’s trust in member $i$ (represented by cell value $X_{ji}$). This was done by taking the lesser value of cells $X_{ij}$ and $X_{ji}$ to represent the level of mutual trust between them, and serves as a conservative measure of mutual trust. To illustrate, if
member i’s trust in member j was scored as 0 and member j’s trust in member i was a 3, their scores in the new mutual trust adjacency matrix, represented in cells $X_{ij}$ and $X_{ji}$, would be 0.

Similar third-party trust relationships. To assess the similarity between two respondents’ mutual trust relationships with other third-party respondents, we used the structural equivalence measure. Following the approach used in prior studies (e.g., Ferrin et al., 2006), we computed structural equivalence using the Pearson correlation as a measure of similarity. This procedure took a member’s row and column entries in the mutual trust matrix, compared them against the row and column entries of all other members in the matrix, and computed the degree of similarity between that member’s profile and that of every other member using the Pearson product correlation coefficient (Wasserman & Faust, 1994). This yielded a structural equivalence matrix where each cell value $X_{ij}$ was the correlation coefficient that represented the extent to which i was structurally equivalent to j in the mutual trust network.

Performance (referral income). Respondents were asked to think about the referrals that they received from each of the other members in the group over the last 12 months, and to indicate the amount of income generated from those referrals. Because income data are typically skewed and at risk of non-normal distribution (Allison, 2001), we examined the skewness and kurtosis of the distribution of referral income. The distribution was non-normal with a skewness of 2.60 ($SE = .17$) and kurtosis of 9.15 ($SE = .34$) and contained some zero values. Therefore, we transformed the referral income variable by adding 1 to the original value and then performing a log transformation. Based on recommendations in previous studies (Hammer & Landau, 1981; Kendall & Stout, 1958), the skewness of -0.98 and kurtosis of -0.26 of the transformed distribution was considered acceptable.
For the dyadic-level analyses relating to mutual trust and third-party trust relationships, the transformed income measure was represented in an \( n \times n \) adjacency matrix, where cell value \( X_{ji} \) reflected the log-transformed referral income that member \( i \) earned based on referrals provided by member \( j \). For the individual- and cross-level analyses relating to individual network centrality and overall network centralization, each respondent’s answers for all the other respondents in the network were aggregated to obtain the total (log-transformed) monetary value of such referrals that the respondent received from the group as a whole. To account for differences in group size (i.e., members in larger groups are likely to receive more referrals than those in smaller groups, other things being equal), we standardized these individual values by dividing them by \((n - 1)\).

**Control variables.** For the individual- and cross-level analyses (H1 and H2), we controlled for age and team tenure because older and more experienced members may be perceived as having access to more information and resources that they can reciprocate referrals with. We also controlled for team size to account for the possibility that members in larger teams have more resources to draw from. For the dyadic-level analyses (H3 and H4), we controlled for the unidirectional trust relationships from member \( i \) to \( j \), and from member \( j \) to \( i \), to rule out the explanation that the referral income that a member received from another was simply a function of the unidirectional (unreciprocated) trust each member had in the other, and to provide a strong test for the role of mutual reciprocated trust. Also, to examine the possibility that a member was more likely to generate referral income for another member who was demographically similar to him/her, we computed two members’ similarities in age, gender, tenure, and industry and assessed the extent to which these predicted the referral income between the two. Because none
of these predictors were statistically significant, we excluded them from subsequent analyses in
order to conserve statistical power for hypothesis-testing.

Data Analysis

**Individual and cross-level hypotheses (H1 and H2).** The model to be tested was
hierarchical, with the dependent variable, individual performance, being an individual-level
construct and the predicting variables spanning the individual and group levels. The data were
also hierarchical since individuals were “nested” in groups. We therefore adopted the
hierarchical linear modeling method (Bryk & Raudenbush, 1992) and tested the model in four
steps. First, we estimated a null model that had no predictors at either level 1 (individual level) or
level 2 (group level) to partition the performance variance into within-groups and between-
groups components. In the second step (level 1 analysis), individual performance was regressed
on group mean-centered individual-level predictor of centrality. In the third step (level 2
analysis), the intercept estimates obtained from level 1 were regressed on grand mean-centered
group level predictor of network centralization to assess the main effects of the group-level
predictor. In the last step, we regressed the slope estimates obtained from level 1 on the group-
level predictor to detect cross-level interaction effects. All the variables were mean-centered
before we tested the models.

**Dyadic-level hypotheses (H3 and H4).** Due to the autocorrelation nature of the network
data, ordinary least square (OLS) regression is not an appropriate analytical tool here
(Krackhardt, 1987). To address the issue of systematic interdependency of network data, we used
the multiple regression quadratic assignment procedure (MRQAP), a nonparametric,
permutation-based method in place of OLS regression (Krackhardt, 1987, 1989). We first
performed the MRQAP regression on each of the 15 groups, then meta-analyzed all 15 groups to
examine combined effects on the relationships of interest. We followed the procedure of meta-
analysis over network data outlined by Krackhardt and Kilduff (1999) and refined by Lai and
colleagues (2009). A $Q$ test was performed to examine if the 15 groups were significantly
different from each other. A non-significant $Q$ statistic indicates that the samples represent a
common population and, consequently, that meta-analyzing them is appropriate. A $p$-pøoler
meta-analytic method (Hedges & Olkin, 1985) was then used, which involves calculating the
Stouffer’s $Z$ statistic with pooled $p$ (indicating the significance of the overall effect size). The
pooled $p$ over 15 groups was calculated based on weighted $p$ for each group. The detailed steps
of this meta-analysis procedure are elaborated in earlier studies (e.g., Krackhardt & Kilduff,
1999), including the advantages of using weighted $p$ over other $p$ values and the computation of
weighted $p$ for each group (Lai et al., 2009).

Results

Table 1 reports the descriptive statistics of the individual- and group-level variables. At
the individual level, trust centrality was significantly correlated to referral income ($r_{[206]} = .24,$
$p < .05$). At the group level, there were no significant correlations between network
centralization and referral income. Individual centrality was also significantly correlated to
network centralization ($r_{[206]} = .31, p < .01$). As the correlations between the two variables
were strong, we calculated the variance inflation factor (VIF) that measures how much the
variance of estimated coefficients of the independent variables are increased over the variance if
there were no correlations among the independent variables. If VIF for one of the variables is
around or greater than 5, there is collinearity associated with that variable (Hair, Anderson,
Tatham, & Black, 2006). The VIF for trust centrality (normalized) and for trust network
centralization (normalized) were 1.1, thereby indicating that multicollinearity was not a significant threat in our analysis of the effects of both independent variables.

Table 2 summarizes the findings of the hierarchical linear modeling, and the results in Model 2 support Hypothesis 1, in that centrality had a significant positive relation with referral income received ($\gamma = 0.07, p < .01$). Model 3 presents the results of the mixed level hierarchical linear model used to test Hypothesis 2. Consistent with that hypothesis, the moderating results were significant ($\gamma = -1.14, p < .05$) and in the predicted direction. Specifically, simple slope analyses at low and high levels of centralization (1 SD below and above the mean respectively) revealed that the relationship between trust centrality and performance was more positive when trust centralization was low ($b = 0.84, SE = 0.04, p < .05$) than when it was high ($b = 0.75, SE = 0.02, p < .05$). Figure 1 plots the simple slopes for the interaction.

We also estimated the strength of the interaction effect by following the recommendations of Aguinis and colleagues (2013). We computed the predictive power of the interaction, which is the extent to which the cross level interaction predicts the outcome of interest. The results indicated that the predictive power of the effect was -1.14, implying that for every one unit increase in centralization, the slope of the relationship between centrality and performance decreased by 1.14 units. We also estimated the effect size using the “pseudo $R^2$” metric, which involves computing a pseudo $R^2$ for each of the steps in the model-building process. We found that the pseudo $R^2$ increased from 0 in the null model to 6% in Model 2, and 10% in Model 3. Thus, the inclusion of centrality explained the variance in performance (referral income) by 6%, and further inclusion of interaction term between centrality and centralization explained another 4% of variance. Together, these two sets of results indicate that the strength of the interaction effect, as well as the sample size of 15 groups, is reasonable.
Table 3 reports the descriptive statistics for the dyadic-level variables in each of the 15 groups, and Table 4 summarizes individual group results as well as meta-analysis statistics that combine all 15 groups. The $\beta^+$ statistic is the weighted estimate of the population beta and indicates the overall effect size of the relationship of interest, while the Stouffer’s Z test with the pooled $p$ value shows the significance level of the overall effect size of the relationship of interest. The $Q$ statistic and its associated $p$ value indicate whether the individual group beta coefficients ($\beta_i$) are significantly different from each other; because the $Q$ statistics for mutual trust and structural equivalence were not significant, these indicate that meta-analysis is appropriate. The meta-analytic results revealed that mutual trust was not associated with referral income ($\beta^+ = -0.02$, Stouffer’s $Z = -0.82$, $p = .79$) after controlling for an individual’s trust in the other party ($\beta^+ = 0.30$, Stouffer’s $Z = 9.03$, $p = .00$) and the other party’s trust in the individual ($\beta^+ = 0.24$, Stouffer’s $Z = 8.33$, $p = .00$). Thus, Hypothesis 3 was not supported. However, as predicted in Hypothesis 4, structural equivalence was positively associated with referral income ($\beta^+ = 0.06$, Stouffer’s $Z = 3.70$, $p = .00$).

Supplementary Analyses

As robustness checks, we repeated the above analyses with groups that reported 80% and 34% response rates (34% being the average response rate found in online studies – Shih & Fan, 2020).
This yielded sample sizes of 10 groups (with 151 respondents) and 22 groups (273 respondents) respectively. Consistent with Hypothesis 1, the relationship between centrality and performance was positive for both the samples with 10 groups ($\gamma = 0.12, p < .05$) and 22 groups ($\gamma = 0.06, p < .05$). Consistent with Hypothesis 2, the relationship between individual centrality and referral income was more positive when network centralization was low than when it was high, both for the sample with 10 groups ($\gamma = -1.67, p < .05$) and the one with 22 groups ($\gamma = -0.26, p < .10$). Similarly, the dyadic-level analyses yielded results that were similar in pattern to those reported previously, in that mutual trust did not predict referral income for the 10-group sample ($\beta^+ = .01, \text{Stouffer's } Z = -0.41, p = .66$) or the 22-group sample ($\beta^+ = -.02, \text{Stouffer's } Z = -0.93, p = .82$), while structural equivalence was positively related to referral income in both the 10-group sample ($\beta^+ = .04, \text{Stouffer's } Z = 2.37, p = .01$) and the 22-group sample ($\beta^+ = .06, \text{Stouffer's } Z = 3.19, p = .00$).

**Discussion**

We empirically demonstrated that interpersonal trust can operate at multiple levels to help members realize performance benefits. We also provided a multi-faceted view of trust by incorporating dyadic-level (i.e., mutual trust and third party trust relations), individual-level (i.e., position in structure of trust relations) and cross-level (i.e., moderating role of pattern of trust relations) trust-based antecedents to individual performance. Building on multiple theoretical mechanisms that operate at different levels, we tested our arguments by combining multiple analytical techniques (including social network analysis, meta-analysis, and hierarchical linear modeling analysis) to examine a multilevel framework of trust. This framework offers one of the first integrated perspectives of the function of interpersonal trust in facilitating individual performance.
In doing so, we extend prior research in several ways. First, we provide empirical evidence that interpersonal trust, operating at multiple levels, can aid one’s performance, an assumption that has received weak and mixed empirical validation thus far. Further, we provide a more realistic and nuanced perspective of interpersonal trust by recognizing that (1) individuals can have different degrees of trust in different targets; (2) such trust can operate at multiple levels concurrently to predict one’s performance; and (3) trust relationships are embedded within a broader social context of other members’ trust relationships that can facilitate or constrain individual action. We demonstrate that the performance benefit deriving from an individual’s position in the trust network is contingent on the positions occupied by other members in the network, and that independent of the presence of direct trust relationships between two parties, their connections with similar third parties in the network can yield performance benefits.

We also enrich theory by articulating the theoretical mechanisms through which interpersonal trust can operate at the individual, dyadic, and group levels, thereby addressing researchers’ call to examine organizational phenomena across multiple levels so as to reflect the realities of social and organizational complexity, and to provide a more comprehensive understanding of such phenomena (Monge & Contractor, 2003). Examining the cross-level performance implications of interpersonal trust also takes a step toward building a body of knowledge on how the whole and the parts of social networks operate simultaneously, and how cross-level forces can facilitate or constrain individual action (Brass et al., 2004; Kilduff & Brass, 2010). Finally, by empirically demonstrating that trust relations can predict performance through multiple avenues, we underscore the instrumental value of such ties, particularly in contexts where formal structures and workflows do not fully dictate how individuals cooperate with and relate to one another.
Research Implications

**Dyadic-level trust dynamics.** We found that structural equivalence, but not mutual trust between two members, is positively associated with the performance of both members. While the non-finding relating to mutual trust was unexpected, we offer a possible explanation for this. Because interpersonal trust reflects a particularly strong form of relationship commitment as compared to other ties such as communication or workflow, the unidirectional, non-reciprocated form of trust relationship may be sufficient in promoting a social exchange-based orientation toward the other party. Thus, when unidirectional trust ties are included as predictors of performance, mutual trust ties do not provide additional explanatory value. Consistent with this argument, the results indicated that individuals aided the performance of those whom they trust, and trustees also helped those who trusted them. This is consistent with norms of reciprocity as well as the fact that the other party’s sharing of confidential work matters provides trustees with more precise understanding of the appropriate types of help and referrals that can meet that individual’s business needs and help him/her overcome business challenges.

Our finding that being structurally equivalent to another person increased the referral income that one party received from the other bolsters the argument that structural equivalence engenders a sense of identification, shared membership, and common fate between two parties (e.g., Ferrin et al., 2006; Milton & Westphal, 2005), as opposed to Burt’s (1982, 1987) contention that structural equivalence engenders competitive forces. This may, in part, be due to the current research context where the nature of the networking groups facilitates a more cooperative rather than competitive orientation, in that each member came from a different industry and offered different products and services, thereby reducing the threat of competition. Additionally, third-party reputational forces inherent in structural equivalence may dampen one’s
inclination to engage in competitive actions and, instead, provide further rationale to cooperate with the other party.

**Cross-Level Trust Dynamics.** We found that members’ betweenness centrality in the trust network was positively associated with their performance, and that the strength of this individual-level relationship was reduced by the degree to which the network had a centralized pattern of trust relations. This finding extends and sheds light on prior studies that examined the independent role of centrality without taking into account the configuration of other relationships in the overall network (e.g., Sparrowe & Liden, 2005). These cross-level findings highlight that while individual-level centrality is valuable, the larger social context in which one is embedded is also important in determining how much benefits ensue from centrality. More generally, these findings support the argument that the social context can constrain or facilitate the workings of individual-level network characteristics, thereby underscoring the importance of taking into account global-network characteristics, and addressing network researchers’ call to simultaneously examine the cross-level effects of social networks (Brass et al., 2004; Kilduff & Brass, 2010).

**Practical Implications**

The results of this study have substantial implications for entrepreneurs in networking groups as well as employees in more traditional workgroups that share similar features as networking groups, such as self-managed teams. The findings suggest that for individuals to benefit from group membership, they should develop trust relations with other members while simultaneously being conscious of the larger configuration of trust relationships that they and other members have. If they are embedded in similar positions as another member in the trust network, they are more likely to receive help from that structurally similar member. Our
combined findings on individual-level betweenness centrality and network centralization suggest that individuals whose position places them on the shortest paths connecting two other members are likely to receive more help, but more so in a group where they are not the only dominant players. Again, this underscores the importance of individuals deciphering the network of interpersonal ties and the level of overall centralization in the larger social landscape, as doing so can inform them on whether to adjust their own centrality position.

Further, to the extent that an individual’s centrality can transform into a bottleneck position in high centralization networks, central players should be cognizant of the possibility that they may impede the flow of trust and resources in the group. In those instances, they may benefit from reducing their own centrality and encouraging some of their trustees to share work issues with other members, so that these central members can then better attend to the remaining trustees’ concerns and, in turn, receive more help from the group. The same notion that an individual’s centrality can impede flow of trust and resources in the group also has implications for global organizations attempting change processes across different countries and regions. Often, the responsibility to drive these changes is assigned to one or a few employees, whereas according to our findings, global organizations might benefit by spreading the responsibility across multiple employees in different parts of the organization.

Limitations and Future Research

Because the results from this study were obtained from measures collected from various sources, with the predictors derived from self- and other-reports at multiple levels, we are confident that the observed relationships are not spurious and not artifacts of common source bias. However, the use of cross-sectional data precludes us from making causal conclusions about the relationships. For instance, a high-performing member can, because of his/her superior
performance, eventually occupy a more central position in the network. However, it is less likely that two parties’ referrals to each other can shape their structural similarity in the overall network, as the latter encompasses relationships among other parties in the network as well; the explanation for one’s performance shaping the observed cross-level interaction effects is also less tenable. Notwithstanding, we recommend that future research adopt a longitudinal approach to establish the directionality of the observed relationships and to bolster confidence in the underlying arguments. Additionally, to the extent that the response rate and relatively low number of groups may have attenuated our ability to detect significant effects, we encourage future research to replicate the findings with larger samples at both individual and group levels.

Another limitation concerns the generalizability of the findings to other forms of work groups embedded in more traditional organizations. As the latter are governed by formal workflow relationships that dictate how members should act in relation to one another, individual’s performance may depend less on discussing confidential matters with others and receiving information and resources at others’ discretion, and thus the effects of informal trust relationships may be attenuated. Nonetheless, given that formal institutionalized mechanisms and workflows cannot fully prescribe how individuals relate to one another, and that informal relationships have been established as predictors of performance even in conventional organizations with formalized systems and procedures, we believe that trust relationships would remain valuable in such groups, and we encourage future research to replicate the present findings in work groups in more traditional organization setting.

We also recommend that future research attempt to replicate our cross-level interaction effects in different group contexts, so as to verify whether the observed effects are generalizable to other settings, particularly those where formal structures and workflows do not fully dictate
how individuals cooperate and relate with one another. Such contexts can occur in knowledge-based organizations (e.g., technology firms, consulting firms) and in certain departments (e.g., research and development units) within manufacturing organizations. As these organizations and departments move away from hierarchical structures and into self-managed team structures, employees will take on a larger role in managing their own careers and performance, and this study highlights how they can configure their trust relationships to augment performance.

Finally, we recommend that future research adopt multi-level and cross-level perspectives to examine other forms of interpersonal relationships, both instrumental (e.g., advice) and expressive (e.g., friendship), and how these influence key behavioral and attitudinal outcomes beyond financial performance. Whereas this study offers preliminary evidence for the multi- and cross-level roles of trust relationships in shaping one’s performance, it also suggests that other instrumental and expressive ties may operate at multiple levels and in nuanced ways to either facilitate or constrain individuals’ actions.

Conclusion

The findings of this study emphasize that an individual’s performance is dependent not only on his/her own initiative but also on the performance-enhancing efforts of other network members and their cumulative pattern of relationships. Thus, decisions made by members to develop interpersonal trust relationships are complex, and it is imperative that future research continue to consider this multilevel perspective of interpersonal trust in examining individual performance within networks.
REFERENCES


Kilduff, M., & Brass, D. J. (2010). Organizational social network research: Core ideas and key debates. *Academy of Management Annals*, 4: 317-357.


FOOTNOTE

1 Because centrality and centralization are distinct concepts focusing on different levels (individual vs. network), it is possible for two networks to have the same centralization score but different betweenness centrality scores for their individual members. For example, in a network where all members are unconnected to each other, each member’s betweenness centrality score is 0, as is the overall network centralization score. In a different network with a “ring” configuration where each member is connected to two other members on each side, each member’s betweenness centrality score will be higher (i.e., more than 0), even though the overall network centralization score remains at 0 because of the non-variance in individual members’ betweenness centrality scores.

2 A comparison of groups in the final sample with excluded ones did not reveal any significant differences in the number of members ($t = 1.69, ns$), number of referrals reported by members ($t = -0.29, ns$), and overall revenue generated from referrals in the group ($t = 0.52, ns$).
Table 1

Means, Standard Deviations, Reliabilities, and Correlations among Individual- and Group-Level Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>46.40</td>
<td>11.70</td>
<td>-.37*</td>
<td>-.08</td>
<td>0.07</td>
<td>0.04</td>
<td>-0.06</td>
</tr>
<tr>
<td>2. Tenure</td>
<td>8.29</td>
<td>8.13</td>
<td>-</td>
<td>0.03</td>
<td>-0.03</td>
<td>-0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>3. Trust centrality</td>
<td>3.85</td>
<td>5.16</td>
<td>-</td>
<td>-</td>
<td>0.07</td>
<td>0.31*</td>
<td>0.24*</td>
</tr>
<tr>
<td>4. Team Size</td>
<td>16.93</td>
<td>5.70</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.35*</td>
<td>0.03</td>
</tr>
<tr>
<td>5. Trust network centralization</td>
<td>0.10</td>
<td>0.05</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.07</td>
</tr>
<tr>
<td>6. Referral income (Dollar)</td>
<td>489.06</td>
<td>46.50</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01.
Table 2

Hierarchical Linear Modeling Results Predicting Referral Income

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.06 (0.08)***</td>
<td>2.05 (0.08)***</td>
<td>2.04 (0.09)***</td>
</tr>
<tr>
<td>Individual model&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>- 0.00 (0.01)</td>
<td>-0.00 (0.01)</td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>0.02 (0.01)</td>
<td>0.02 (0.01)</td>
<td></td>
</tr>
<tr>
<td>Individual centrality</td>
<td>0.07 (0.02)**</td>
<td>0.10 (0.03)**</td>
<td></td>
</tr>
<tr>
<td>Group model&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Size</td>
<td></td>
<td>0.01 (0.02)</td>
<td></td>
</tr>
<tr>
<td>Network centralization</td>
<td></td>
<td>0.79 (1.98)</td>
<td></td>
</tr>
<tr>
<td>Moderating model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrality * centralization</td>
<td></td>
<td>-1.14 (0.49) *</td>
<td></td>
</tr>
<tr>
<td>Model deviance&lt;sup&gt;c&lt;/sup&gt;</td>
<td>611.87</td>
<td>561.73</td>
<td>587.73</td>
</tr>
</tbody>
</table>

Note: Results are estimated fixed effects. Standard errors are in parenthesis.

<sup>a</sup> Individual n = 206.
<sup>b</sup> Networking groups n = 15.
<sup>c</sup> Deviance is a measure of model fit.

* p < .05
** p < .01
*** p < .001
Table 3

Descriptive Statistics of Dyadic-Level Variables Across 15 Groups

| Variable                  | Group 1 (n = 11) | Group 2 (n = 6) | Group 3 (n = 15) | Group 4 (n = 15) | Group 5 (n = 17) | Group 6 (n = 20) | Group 7 (n = 19) | Group 8 (n = 16) | Group 9 (n = 15) | Group 10 (n = 15) | Group 11 (n = 13) | Group 12 (n = 10) | Group 13 (n = 19) | Group 14 (n = 19) | Group 15 (n = 14) |
|---------------------------|------------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Dyadic observations       | 110              | 30             | 210              | 210              | 272              | 380              | 90               | 342              | 240              | 156              | 210              | 90               | 342              | 182              |
| Trust in another          |                  |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| M                         | 0.80             | 1.00           | 0.74             | 0.91             | 1.04             | 0.62             | 0.58             | 0.33             | 0.73             | 0.62             | 0.67             | 0.47             | 0.93             | 0.66             | 0.87             |
| SD                        | 1.18             | 1.39           | 1.06             | 1.26             | 1.10             | 0.99             | 0.87             | 0.78             | 1.01             | 0.99             | 1.13             | 1.06             | 0.89             | 1.01             | 1.04             |
| Trusted by another        |                  |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| M                         | 0.80             | 1.00           | 0.74             | 0.91             | 1.04             | 0.62             | 0.58             | 0.33             | 0.73             | 0.62             | 0.67             | 0.47             | 0.93             | 0.66             | 0.87             |
| SD                        | 1.18             | 1.39           | 1.06             | 1.26             | 1.10             | 0.99             | 0.87             | 0.78             | 1.01             | 0.99             | 1.13             | 1.06             | 0.89             | 1.01             | 1.04             |
| Mutual trust              |                  |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| M                         | 0.44             | 0.13           | 0.30             | 0.46             | 0.49             | 0.36             | 0.16             | 0.09             | 0.37             | 0.28             | 0.43             | 0.11             | 0.40             | 0.35             | 0.52             |
| SD                        | 0.85             | 0.50           | 0.69             | 0.91             | 0.75             | 0.76             | 0.36             | 0.37             | 0.78             | 0.58             | 0.92             | 0.60             | 0.61             | 0.79             | 0.83             |
| Structural equivalence    |                  |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| M                         | 0.08             | 0.36           | 0.19             | 0.35             | 0.18             | 0.08             | 0.15             | 0.11             | 0.11             | 0.14             | 0.14             | 0.41             | 0.46             | 0.28             | 0.20             |
| SD                        | 0.27             | 0.47           | 0.24             | 0.24             | 0.24             | 0.24             | 0.19             | 0.29             | 0.24             | 0.22             | 0.30             | 0.25             | 0.31             | 0.38             | 0.25             |
| Referral income (dollar)  |                  |                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| M                         | 419.09           | 590.00         | 443.33           | 754.29           | 818.01           | 380.00           | 425.56           | 307.89           | 373.75           | 465.38           | 348.10           | 447.78           | 56.67            | 667.54           | 754.95           |
| SD                        | 1256.80          | 1200.10        | 1530.76          | 1810.21          | 2049.52          | 1113.59          | 1214.78          | 1282.44          | 1208.49          | 1564.21          | 950.70           | 1205.93          | 199.47           | 1869.96          | 1984.46          |

Note. The total number of dyadic observations across the 15 groups is 2,894.
### Table 4
Meta-Analysis Results Predicting Referral Income (15 Groups)

<table>
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<th>Variable</th>
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<th>Meta-analysis statistics</th>
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**Note.** Beta coefficients are standardized. Both weighted p and pooled p are one-tailed. The degree of freedom for the Q statistic is 14. Coefficients for the unreciprocated trust variables are not displayed here for conciseness of presentation.
Figure 1

Interaction Effect of Trust Centrality and Trust Network Centralization on Performance