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The impact of interpersonal affective relationships and awareness on expertise seeking: A multilevel network investigation

Y. Connie Yuan[1], Inga Carboni[2], and Kate Ehrlich[3]

[1]Department of Communication, Cornell University, Ithaca, NY, USA
[2]College of William and Mary, Mason School of Business, Williamsburg, VA, USA
[3]IBM T. J. Watson Research, Cambridge, MA, USA

Transactive memory theory suggests that general awareness of expertise location in a group is sufficient to predict expertise seeking. Yet expertise seeking is, at least in part, a social phenomenon between two individuals embedded in a network of social relationships. Taking a multilevel, network perspective, we examined the interplay of affective relationships and awareness on expertise seeking in groups. Hypotheses were tested using network data collected from 693 employees in 53 sales groups. HLM analysis results indicated that awareness of expertise distribution positively influenced the decision to seek expertise at all levels of analysis examined. In addition, both positive and negative affective relationships influenced expertise seeking, although their pattern of influence differed across different levels of analysis. More specifically, having either a positive or a negative affective relationship with another group member affected the decision to seek expertise from that person. Although having many positive relationships had a positive effect on expertise seeking, having many negative affective relationships had no effect. Moreover, having both an awareness and a positive affective relationship with another group member amplified their positive effect on expertise seeking. Last, individuals who had more negative affective ties were less likely to leverage the positive impact of each awareness relationship on expertise seeking.

Keywords: Affective ties; Expertise seeking; Multilevel; Social networks; Transactive memory.

Among knowledge workers, competitive gains are achieved when individual expertise can be accessed by others as needed (Lesser, 2000). Technological changes, the increasing globalization of organizations, and the trend towards distributed work have made it increasingly difficult for individuals to locate and access expertise (Alavi & Leidner, 2001). Transactive memory (TM) theory (Wegner, 1986) has been a widely used framework within which to consider expertise seeking (Moreland & Argote, 2003). TM is defined as the set of knowledge possessed by group members along with the shared awareness of "who knows what" (Faraj & Sproull, 2000; Wegner, 1986, 1995). It exists when members use one another as external memory devices to store and process information. Despite its growing popularity (Lewis & Herndon, 2011; Ren & Argote, 2011), recent work suggests that the theory has two limitations. One, TM theory's highly cognitive emphasis on awareness of expertise has not given sufficient weight to the characteristics of affective relationships between expertise providers and seekers (Alavi & Leidner, 2001;

Borgatti & Cross, 2003; Yuan, Carboni, et al., 2010). This is surprising given existing research demonstrating that positive affective relationships shape the expertise-seeking process (Casciaro & Lobo, 2008), and that negative affective relationships may influence similar outcomes differently and more strongly than positive affective relationships (Labianca & Brass, 2006). One of the primary goals of the current research is to explore how positive and negative affective ties among group members, along with awareness of expertise distribution, influence the extent to which group members seek expertise.

A second limitation of the original TM theory is that it tends to focus on awareness of expertise at the aggregated group level only. As pointed out by Rousseau (1985), "most of what we study in and about organizations are phenomena that are intrinsically mixed-level" (p. 2). Defining TM as a purely group-level phenomena leads to models that fail to consider the mechanisms by which TM emerges from dynamics at a lower level of analysis (Lewis & Herndon, 2011; Yuan, Carboni, et al.,

2010; Yuan, Fulk, Monge, & Contractor, 2010), or the cross-level impact of social context on the decision to seek expertise from someone. Previous studies of expertise seeking from the TM perspective have focused on either collective phenomena or individual cognitions (Lewis & Herndon, 2011) or, in a handful of cases, on *network* or, dyadic-level, data (e.g., Borgatti & Cross, 2003; Casciaro & Lobo, 2008), but only rarely on multiple levels (for exceptions, see Yuan, Carboni, et al., 2010; Yuan, Fulk, et al., 2010), and never on on all three levels simultaneously. Considering multiple levels of analysis allows evaluation of the connection and disconnection among concepts at different levels of analysis, models interdependence of observations, and partitions both the main effect and cross-level contextual effect of higher level factors on lower level dynamics (Kozlowski & Klein, 2000).

To address these conceptual and methodological shortcomings in the research literature on expertise seeking, the current study presents a multilevel network model of expertise seeking that includes variables at dyadic, individual, and group levels. We test our model using data collected from 693 members of 53 sales groups in a large multinational corporation.

THEORETICAL BACKGROUND

Transactive memory and expertise seeking

TM theory (Wegner, 1986) provides the conceptual framework for our study on factors that may impact an individual's decision to seek expertise from another group member. According to TM theory, expertise seeking depends upon awareness of expertise location (Faraj & Sproull, 2000; Wegner, 1986, 1995). As long as group members know who has the needed knowledge and how it is commonly labelled, they can seek expertise from one another as needed (Wegner, 1986, 1995). The greater the level of awareness of "who knows what" in the group, the more expertise is potentially available to the group. In this article, along with many other researchers (e.g., Austin, 2003; Borgatti & Cross, 2003; Yuan, Carboni, et al., 2010), we focus on awareness of expertise location or, "who knows what", in a group as the defining aspect of TM (Ellis, 2006; Peltokorpi, 2008).

TM was originally conceived as a concept to describe group cognition at the collective level only (Wegner, 1986, 1995). Recently, scholars have argued that potential asymmetries in the distribution of awareness on the dyadic and individual level indicate that TM is better conceptualized as a multilevel construct and that defining TM as a purely group-level phenomena leads to models that fail to consider differences across individual group members in their knowledge of expertise distribution (Lewis & Herndon, 2011; Yuan, Carboni, et al., 2010). Futhermore, awareness of expertise location at higher levels can be distinct or disconnected from awareness at lower levels (Yuan, Carboni, et al., 2010). One of the underlying assumptions of TM is that members are motivated to share their knowledge to benefit the group (Lewis & Herndon, 2011). This assumption is challenged by the common observation that some individual employees choose to hoard expertise (Alavi & Leidner, 2001; Cabrera & Cabrera, 2002). Especially when making expertise available does not bring tangible benefits, self-interested employees may decide to focus more on their own task responsibilities or on pursuing incongruent goals (Jarvenpaa & Majchrzak, 2008) rather than on making others aware of their expertise (Alavi & Leidner, 2001). It is also possible that they make expertise known and available to a selective few with whom they share close ties. Existing TM theory cannot adequately account for the previously mentioned scenarios. Hence, there is a need for an expansion of the original TM theory that includes consideration of multilevel phenomena.

According to Kozlowski and Klein (2000), higher level properties may emerge from lower level properties through an emergence process that ranges from one based on composition to one based on compilation. Within groups, composition emergence occurs when emergent group properties are essentially the same as those at the individual level, whereas compilational emergence occurs when emergent group properties combine to produce distinctively different higher level properties. Our constructs are isomorphic across different levels in that they share the same basic content, meaning, and construct validity. For this reason, our model assumes compositional emergence. Emergent properties of the collective, once stabilized, can also exert contextual influences downward to shape individual-level behaviours, cognitions, and affect (Kozlowski & Klein, 2000). As a result, higher level properties not only emerge from a convergence of lower level properties but may also exert cross-level influences on those same lower level properties.

Expertise perception by each individual group member can be approached at two levels (see Table 1 for a description of research variables and their measurement). First, at the lowest level, TM can be conceived as a property of one person's perception of each of his or her group member's expertise (Yuan, Carboni, et al., 2010), i.e., whether group member A is aware of group member B's expertise (Borgatti & Cross, 2003). Given that expertise seeking is shaped by awareness of expertise location (Wegner, 1986), awareness of a particular person's expertise should be reflected in the likelihood of seeking expertise from that person (Borgatti & Cross, 2003). It is hence hypothesized:

> *Hypothesis 1a:* Awareness of another group member's expertise will be positively associated with expertise seeking from that member.

TABLE 1
Definition and measurement of research variables

	Definition	Measurement	Hypotheses
Dependent variable			
Expertise seeking	Member A's decision to seek expertise from a specific fellow group member	The extent to which member A turns to a specific member for information or advice before making a major decision	All
Level-1 research variables			
Awareness	Member A's awareness of the expertise held by a specific fellow group member	The extent to which member A is aware of a specific member's current work responsibilities and areas of expertise	1a*, 2b*, 2d, 2f, 3b, 3d, 3f
Positive affective ties	Member A's perception of a positive affective relationship with a specific fellow group member	The extent to which member A agrees that interactions with the specific member are enjoyable	2a*, 2b
Negative affective ties	Member A's perception of a negative affective relationship with a specific fellow group member	The extent to which member A prefers to avoid interactions with the specific member	3a*, 3b
Level-2 research variables			
Awareness	Extent to which member A is aware of expertise held by all group members	Normalized outdegree centrality in awareness intragroup network	1b*
Positive affective ties	Extent to which member A has positive relationships with all group members	Normalized outdegree centrality in positive affective intragroup network	2c*, 2d
Negative affective ties	Extent to which member A has negative relationships with all group members	Normalized outdegree centrality in negative affective intragroup network	3c, 3d*
Level-3 research variables			
Awareness	Extent to which all group members are aware of "who knows what" in the group	Density of within-group awareness network	1c*
Positive affective ties	Extent to which all group members have positive relationships with each other	Density of within-group positive affective network	2e, 2f
Negative affective ties	Extent to which all group members have negative relationships with each other	Density of within-group negative affective network	3e, 3f

*Supported.

Second, at one level up is an individual group member's total knowledge of expertise distribution within a group, i.e., individual-level awareness. It measures the extent to which member A is aware of expertise distribution across the whole group. Given that group member A may indicate awareness relationships with multiple group members (e.g., A→C, A→D, etc.), these dyadic pairings all "belong to" A and therefore can be treated as nested within group member A. An individual who has deep knowledge of one or two sources of expertise (i.e., high awareness regarding a particular person) but is unaware of many other sources of expertise in a group will have low individual awareness. This might be the case, for example, if some individuals are isolates in a network and hence do not have adequate chances to learn about the other's expertise. A stronger general awareness of expertise distribution at the individual level equips expertise seekers with a wider range of knowledge labels and a richer vocabulary with which to communicate with people from different backgrounds. Individuals using this knowledge may feel more confident in raising the right questions to the right experts in each dyadic interaction. It is proposed:

Hypothesis 1b: Individuals with high total awareness of expertise across his or her fellow group members will be more likely to seek expertise from each relationship.

Although a person's awareness of a particular group member's expertise and his or her awareness of expertise distribution across the whole group are similar concepts, they are likely to affect expertise seeking in different ways. For instance, if group member A is aware of the expertise held by C and D, and group member B is aware of the expertise held by E and F, A is more likely to seek expertise from C and D whereas B is more likely to seek expertise from E and F. Such differences can only be captured when awareness and expertise seeking are examined pairing by pairing, but will be missed if the focus is on individual level because A and B will have identical scores on individual-level measures of awareness (i.e., both A and B know two people's expertise).

In keeping with the original articulation of TM, group-level awareness indicates the extent to which members of a group are aware of each other's expertise. Many studies have confirmed that a well-developed

TMS is associated with superior group outcomes (Lewis, 2004; Zhang, Hempel, Han, & Tjosvold, 2007). When awareness of expertise distribution is generally high in a group, multiple avenues to learn about expertise distribution become available to each individual group member. High group-level awareness therefore implies rich collective resources that members can draw upon. Even when a member has low individual-level awareness of others' expertise, high group-level awareness may allow him or her to draw upon fellow group members' knowledge of expertise distribution to locate expertise within the group. As a result, members of high-awareness groups may seek more expertise than members from low-awareness groups.

> *Hypothesis 1c:* Group-level awareness will be positively associated with expertise seeking from each relationship.

Interpersonal affective relationships and expertise seeking

According to TM theory, expertise seeking requires only awareness of knowledge location (Wegner, 1995). Yet, interpersonal affective relationships may also shape expertise seeking (Cross, Rice, & Parker, 2002; Faraj & Sproull, 2000). We propose that, like awareness, the impact of affective relationships on expertise seeking occurs at three levels: each affective relationship held by an individual, an individual's total affective ties, and the average of affective relationships within a group (i.e., network density).

Positive affective interpersonal relationships. Positive interpersonal affective ties are dyadic relationships characterized by liking and pleasant feelings (Lawler, 2001). Having a positive affective relationship with another person can positively influence the likelihood of seeking expertise from that person for at least four reasons. One, people are more likely to seek expertise to the extent that they feel positively towards the source, even when they are aware of alternative sources that can provide better quality information (Casciaro & Lobo, 2008). Positive affective interpersonal ties are more likely to create psychological safety which makes seekers comfortable exposing a knowledge deficit or asking for help in developing competencies (Edmondson, 1999). Two, experts may be more willing to share their expertise when they have positive affective relationships with expertise seekers because such relationships are rewarding to maintain, leading individuals to give people what they request in order to enjoy the social rewards of their positive relationship (Homans, 1950). Three, positive affective relationships are also more likely to adhere to a norm of reciprocity (Gouldner, 1960), supporting the expertise seekers' expectation that useful information will be provided

when sought which further reduces barriers to expertise seeking. Expertise providers' willingness to share may increase their perceived accessibility (cf. Borgatti & Cross, 2003). Last, individuals are more likely to trust individuals that they like and trust is associated with higher levels of knowledge sharing (Levin & Cross, 2004).

> *Hypothesis 2a:* Positive affective ties will be positively associated with expertise seeking from each relationship.

It is important to note that, although awareness of expertise and positive affective connections may be associated, they are conceptually distinct constructs. For example, it is possible to have high levels of awareness without correspondingly high levels of positive affect when organizational members learn about another person's specialized expertise through an intranet system or an expertise directory. It is also possible to have high levels of positive affective connections without correspondingly high levels of awareness of expertise when the enjoyable interactions with a colleague centre on, say, families or shared hobbies. However, we anticipate higher levels of expertise seeking will occur when an individual is both aware of the other's expertise and also enjoys the other person (Yuan, Carboni, et al., 2010). Relationships that have both task-related (i.e., instrumental) and affective components tend to be stronger than relationships that are only task related (Homans, 1950). Strong relationships are more likely to be accessed to convey information, especially when the information is or is expected to be complex, or hard to articulate, and hence take a longer time to convey (Szulanski, 1996).

> *Hypothesis 2b:* Positive affective ties will interact with awareness in influencing expertise seeking such that having a positive affective tie will increase the positive effect of awareness on expertise seeking from each relationship.

Like awareness, affective relationships can also be summarized to the individual level of analysis to examine how a person's overall level of positive affective relationships influences the extent of expertise seeking from any one particular member. At this aggregated level, we expect individuals who report more positive affective relationships to others to be more likely to seek expertise from any other group member for at least three reasons. One, having stronger direct relationships with coworkers also increases the likelihood of influencing indirect (friends of a friend) relationships with coworkers. Third parties can serve as references and reputation vouchers, raising expectations that experts will help expertise seekers as a function of keeping positive relationships with their friends (Venkataramani & Dalal, 2007). Two, having more numerous positive intragroup

relationships are associated with trust (Edmondson, 1999) and, as such, may result in relational spillover that supports a generalized belief that all teammates are trustworthy (cf. Brickson, 2005). Trust increases expertise seeking because it contributes to belief in the safety of interpersonal risk taking (Edmondson, 1999; Levin & Cross, 2004). Last, neuropsychological evidence suggests that having more positive relationships among colleagues builds physiological resourcefulness which gives individuals a strong foundation for the effort needed to engage in their work role (Heaphy & Dutton, 2008), suggesting that having more positive relationships may build capacity to maintain motivation when seeking expertise.

> *Hypothesis 2c:* Individuals with more positive affective relationships among group members will be more likely to seek expertise from each relationship.

We further expect that the positive effect of individual-level awareness on expertise seeking will be amplified by high individual-level positive affective relationships. A person with more positive ties has a richer pool of social capital from which to draw resources, such as expertise. At the same time, having a greater overall awareness of expertise location increases the actual resources available to the individual (cf. Adler & Kwon, 2002). For example, an individual (A) who is aware that B's expertise is related to the desired expertise, can leverage her positive relationship with B to locate the desired expertise by asking B where that expertise is located. Given B's own expertise, B is more likely to know the location of the requested expertise and to provide group member A with the location and perhaps also a personal introduction to the expertise provider. As a result, individuals with more positive affective ties will have a higher possibility of turning awareness of expertise distribution into actual expertise seeking (Yuan, Carboni, et al., 2010) than those with fewer positive affective ties.

> *Hypothesis 2d:* Individual-level positive affective ties will moderate the lower level relationship between awareness and expertise seeking such that higher levels of individual positive affective ties will increase the positive effect of awareness on expertise seeking within each relationship.

Individual-level relationships can be further summarized to the group level. Group-level constructs can create normative expectations that exert contextual influence on lower level dynamics in a group (Rousseau, 1985). In this case, collectives that have more positive affective relationships also tend to have stronger reciprocity norms, higher levels of mutual trust, and more social sanctions against self-serving

behaviour (Coleman, 1990), all of which may make expertise seeking more likely. Reputation is the mechanism by which members of closely-knit groups monitor and sanction each other (Burt, 2005). If one person fails to provide requested information to another member, knowledge of this failure to help another group member will be quickly distributed among members of a dense network. To avoid gossip and the social disapproval (or even rejection) that comes with it, members of closely-knit groups are more likely to respond positively to requests from other members, even if they have no direct relationship (Burt, 2005). Knowing this, individuals may feel more confident seeking expertise.

> *Hypothesis 2e:* Group-level positive affective ties will be positively associated with expertise seeking from each relationship.

In addition to the previously mentioned main effect, a moderation effect of group positive affective ties on a lower level relationship between expertise awareness and expertise seeking can also happen: Dense group-level positive affective ties may also make it significantly easier to leverage existing awareness relationships. Because individuals in positive group contexts have a greater trust in reciprocity norms, members may be more likely to help each other, confident that similar help will be returned by the same or some other group member (Edmundson, 1999). For this reason, individuals may be more likely to believe that requested expertise will be competently and willingly communicated. They may also have a more nuanced understanding of others' expertise as a function of members' tendency to engage in social interactions, making locating existing expertise easier (Hollingshead & Brandon, 2003).

> *Hypothesis 2f:* Group-level positive affective ties will moderate the lower level relationship between awareness and expertise seeking such that higher group-level positive affective ties will increase the positive effect of awareness on expertise seeking from each relationship.

Negative affective relationships. In contrast to positive affective ties, negative affective ties are social ties characterized by dislike, uncertainty, anxiety, or fear (Watson, Clark, & Tellegen, 1988). We expect negative interpersonal affective relationships to have a negative impact on expertise seeking for at least three reasons. First, a negative affective relationship is likely to be accompanied by efforts to reject or otherwise minimize or eliminate interpersonal interaction with the other person (Orcutt, 1973). A long line of research provides evidence that individuals tend to avoid task interactions with people they do not like (Homans, 1950). Second, individuals may feel that the negative interpersonal

relationship threatens their general well-being and respond defensively by withdrawing psychologically or physically (Pearson & Porath, 2005; Watson, Clark, McIntyre, & Hamaker, 1992). Last, when the negative relationship arises as a function of negative actions by the other party, individuals tend to reduce efforts to generate or inspire innovation (cf. Pearson & Porath, 2005) and will turn to other sources to gather needed information (Jehn, 1995).

> *Hypothesis 3a:* Negative affective ties will be negatively associated with expertise seeking from each relationship.

Negative or "arduous" ties make individuals more likely to misunderstand or misinterpret each other's words, actions, and motivations with a negative bias (Jehn, 1995; Szulanski, 1996). Having a negative relationship may make the potential expertise seeker more likely to perceive the other person as unwilling to share information or unable to articulate it adequately (Labianca & Brass, 2006). It may also make the individual more likely to negatively evaluate the other's performance and reputation (Labianca & Brass, 2006). Expectations such as these may dampen seekers' willingness to leverage awareness of expertise distribution to direct expertise seeking (cf. Jehn, 1995). It may also prompt the potential expertise seeker to withdraw from collaborative efforts that involve the other person (Pearson & Porath, 2005). Thus, even though an individual may be aware of the expertise held by another member, he or she may be less likely to seek expertise from that person.

> *Hypothesis 3b:* Negative affective ties will interact with awareness in influencing expertise seeking such that having a negative affective tie will decrease the positive effect of awareness on expertise seeking from that member.

Similar to the first two sets of constructs, negative affective ties can be aggregated to the individual level to examine whether a person's combined negative ties will influence expertise seeking. Several lines of research suggest that having more negative relationships may decrease expertise seeking. One, individuals who indicate many negative relationships are more likely to be the target of negative gossip (Burt & Knez, 1996), undermining their reputation among unconnected individuals and making them less likely to be trusted (Chua, Ingram, & Morris, 2008). Having more negative ties reduces the probability of receiving expertise from others because people are reluctant to jeopardize other relationships by helping a friend's "enemy" (Venkataramani & Dalal, 2007). As a result, other individuals may make themselves even less accessible for expertise-providing, reducing the likelihood that the focal person will seek them

out for expertise (Yuan, Carboni, et al., 2010). Additionally, group members who have more negative affective ties with group members may be indicating a generalized distrust of group members (cf. Pearson & Porath, 2005). According to behavioural regulation theory, for people with negative or distrustful attitudes towards others, social interaction becomes an aversive stimulus (i.e., threat), such that considering an interaction activates the behavioural inhibition system, prompting withdrawal and avoidance behaviours (Carver, Sutton, & Scheier, 2000). Because it is a fundamentally social interaction, individuals who have more negative ties are therefore less likely to engage in expertise seeking.

> *Hypothesis 3c:* Individuals with more negative affective relationships among group members will be less likely to seek expertise from each relationship.

Previous research supports the notion that individual group members with more negative affective ties may be predisposed to avoiding other individuals, even when aware of their expertise (Casciaro & Lobo, 2008). This may be because individuals with more negative ties are more likely to believe (rightly or wrongly) that experts will not share their expertise or, if they do, may purposefully distort it (Labianca & Brass, 2006). Research on negative affect further suggests that, whereas indicating a specific negative affective relationship with another organizational member may be a function of unique and perhaps unusual circumstances, indicating many such relationships, may indicate high individual-level negative affect (Brief, Butcher, & Roberson, 1995; Labianca & Brass, 2006). High negative-affect individuals tend to have difficulty processing complex information (Forgas, 1995), making it harder for them to find ways to elicit and absorb expertise from others (Huang, 2009). Understanding this, they may be less likely than others to seek out a person for expertise, even when aware of another's expertise.

> *Hypothesis 3d:* Individual-level negative affective ties will moderate the lower level relationship between awareness and expertise seeking such that higher levels of individual negative affective ties will decrease the positive effect of awareness on expertise seeking within each relationship.

Negative affective ties can also be further aggregated to the group level. A dense network of negative affective ties may indicate undesirable group affective tones or social norms that are destructive to collaboration and sharing (Barsade, 2002). High levels of tension, annoyance, or animosity among group members can negatively influence group information processing (Jehn, 1995), group cohesion (Jehn, Greer, Levine, & Szulanski,

2008), trust (Porter & Lilly, 1993), and respect among group members (Porter & Lilly, 1993). As a result, individual members may anticipate a negative response to requests for expertise and therefore be less likely to seek it.

> *Hypothesis 3e:* Group-level negative affective ties will be negatively associated with expertise seeking from each relationship.

In addition to the previously mentioned main effect of group negative affective relationships, a moderation effect may also occur: When the group context is negative, it may be even more difficult for individuals to utilize expertise awareness to support expertise seeking. Individuals tend to adapt their behaviours and cognitions to match those of their social environment (Schneider, 1975). A negative group context may encourage individuals to believe that others will maliciously distort, misrepresent, or otherwise purposefully miscommunicate (Felps, Mitchell, & Byington, 2006). Similarly, a generalized lack of trust in the benevolence of others may lead individuals to believe that other members will not contribute to the collective good by sharing their expertise (Levin & Cross, 2004). As a result, individual members may forgo making use of their expertise awareness when making decisions to seek expertise.

> *Hypothesis 3f:* Group-level negative affective ties will moderate the lower level relationship between awareness and expertise seeking from each relationship such that higher group-level negative affective ties will decrease the positive effect of awareness on expertise seeking from each relationship.

METHOD

Sample

To test our hypotheses, we conducted a Web-based survey of 53 US account teams within a large international organization based in the United States that specializes in enterprise technology and related services. The sales groups provide hardware, software, and other technology services to their clients. Group members represent a variety of roles, including information technology specialists and relationship managers. Individuals were not necessarily colocated, although most were within a few hours' drive of each other. Groups have a matrix structure such that members represent different functional divisions and report to a division manager rather than the group leader.

Senior management within the organization, including the executive vice president of sales operations, provided detailed information regarding the structure, dynamics, and composition of typical and specific sales groups. Their insights helped shape survey items so that they made sense to participants. They also played a key role in helping us identify potential groups to participate in this study. Three executive vice presidents of regional sales in the United States jointly generated a list of 60 extended account groups in their region that were "well-positioned" or "struggling". The leaders of the groups were contacted and 53 agreed to participate. They, in turn, provided the names of the sales group members. An invitation to participate in the Web-based study was emailed to all group members. Altogether 898 members of 53 groups were invited to participate in the study. This invitation was followed up by emails from the group leader as well as phone calls by senior researchers within the organization. Of these, 693 responded to the survey, yielding a response rate of 77%. The average participant had been with the organization between 2 and 5 years.

Measures

All research variables, including *awareness, affective ties,* and *expertise seeking*, were measured with social network data. A roster of names was provided for each group. The network questions asked participants to indicate their agreement (1 = "strongly disagree", 5 = "strongly agree") with a series of statements relative to every single member of their group regarding the extent to which they: turn to this person for information or advice before making a major decision (*expertise seeking*), are aware of this person's current work responsibilities and areas of expertise (*awareness*), enjoy interactions with this person (*positive affective ties*), and avoid interactions with this person (*negative affective ties*). Each individual's responses regarding each of his or her ties with each of his or her group members formed the (level-1) measures of the research variables, i.e., *expertise seeking*, *awareness*, *positive affective ties*, and *negative affective ties*.

Using a standard network procedure for data aggregation, individual ties as described earlier were aggregated to create normalized outdegree centrality, which equals the average value of a particular type of tie (e.g., awareness) held by one person relative to the maximum possible degree in that person's group. Such a standardized measure is needed because it helps to make across-group comparisons. Through this procedure, a number of level-2 measures, including *individual-level awareness, individual-level positive affective ties,* and *individual-level negative affective ties* were calculated using the social network analysis tool UCINET 6.0 (Borgatti, Everett, & Freeman, 2002).

At level-3 (group level), individual-level ties were aggregated to create densities. The *density* of a valued network is the sum of all tie values actually present divided by the number of possible tie values. Density of awareness network measures TM at the collective

level because it captures Wegner's conceptualization of the concept as a network of individual minds (Yuan, Carboni, et al., 2010). The densities of these different types of networks were calculated in UCINET to measure *group-level awareness, group-level positive affective ties, and group-level negative affective ties*.

It should be noted that using the same vector of data to construct our variables at different levels of analysis follows well-established procedures in social network analysis and is also consistent with our approach to multilevel theorizing. As we have argued in the presentation of our conceptual model, our constructs share the same meaning, content, and construct validity across levels. Aggregated values of lower order measures are appropriate measures of higher level constructs in compositional models (Kozlowski & Klein, 2000).

Control variables were added at all three levels of analysis.[1] A level-1 control variable, *difference in location*, indicated whether the two group members worked at the same location (a dummy variable with 1 = "same location", and 0 = "different location"). It was included because employees at the same locations would be more likely to interact and therefore also more likely to learn about each other's expertise. In addition, participants were also asked about how long they had worked with the group: less than 1 year, 1 to 2 years, 2 to 3 years, and more than 3 years. Based on this individual-level control variable, a relational control variable was added, *difference in group tenure, which represented the difference in tenure between two individuals*. In addition, a group-level control variable, average group tenure, was also calculated to evaluate overall how long the group had worked together. Tenure at different levels of analysis could affect awareness and expertise seeking because the longer that a person has stayed in a group, the higher his or her chance of knowing where to seek expertise. Finally, at the group level, group size was included as a control variable because it is more difficult to develop awareness of expertise distribution and to seek expertise in large groups.

Analysis

The hypotheses were tested using hierarchical linear modelling (HLM). Given that the dyadic relationships were clustered by each individual person and individual persons were clustered by each project group, violating ordinary least squares (OLS) assumptions of independence of observations, HLM analysis was needed to obtain unbiased estimates of standard errors for hypothesis testing that could not be obtained using OLS hierarchal regression (Raudenbush & Bryk, 2002).

Because interaction effects were hypothesized, variables were centred so that the intercepts from these models can be more easily interpreted than those obtained with the raw data (Raudenbush & Bryk, 2002). Specifically, all the key research variables were group-mean centred at level-1 and level-2 of the model such that the data used for analysis were deviance scores between the raw data and the mean of each clustering unit (i.e., individual and group). This centring procedure is preferred when investigating a slopes-as-outcome model as we did in this study (Hofmann & Gavin, 1998). Following Enders and Tofighi's (2007, p. 121) recommendation, level-3 variables were grand-mean centred prior to analysis.

Following the data analysis strategy as recommended by Hox (2002/2008), a null model was run to obtain information with which to decompose variances at different levels of analysis. Variables were then entered level by level to evaluate reduction in error variance by variables at each level of analysis, as reflected in pseudo R^2s at multiple levels. Because all the models tested in this study are nested, differences in deviance scores between a pair of nested models were calculated to evaluate the significance level in model improvement (Hox, 2002/2008; Raudenbush & Bryk, 2002). Since differences in deviance scores follow a χ^2 distribution, a significant χ^2 value resulting from a χ^2 difference test means that the improvement in model fit is significant. Random components for each parameter were included at each step of model building. If the results showed no significant variance in the intercept and/or the slope estimates, the random components were dropped from subsequent modelling to improve model parsimony (Snijder & Bosker, 1999). Intercept-as-outcome models were run to test Hypotheses 2c, 2e, 3c, and 3e, because these hypotheses examined the main effects of higher level variables on the dependent variable, and slope-as-outcome models were run to test Hypotheses 2d, 2f, 3d, and 3f, because these hypotheses examined cross-level interaction effects on the dependent variable.

RESULTS

Descriptive statistics and zero-order correlations are reported in Tables 2A–2C. Correlation coefficients are calculated level by level because disaggregating higher level variables to lower levels of analysis to calculate correlations among variables across different levels is inadequate to deal with the nested nature of the data (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999). Variables at level-1 and level-2 were group-mean centred prior to calculating the correlation coefficients to control for the grouping effects in these variables (Kreft, Leeuw, & Aiken, 1995).

To determine whether common method bias would affect the result of our analysis, we used the marker variable procedures outlined in Lindell and Whitney

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[1] To test for possible biases introduced by control variables (Spector & Brannick, 2011), control variables were included before and after entering the hypothesized main and interaction effects. Because results were consistent regardless of the order in which control variables were entered, only models in which controls were entered before research variables are presented.

TABLE 2A
Descriptive statistics of level-1 variables (*n* ranges from 8430 to 19,986)

	Mean	*sd*	*1*	*2*	*3*	*4*	*5*
1. Different location	0.828	0.377					
2. Difference in group tenure	0.000	1.630	.000				
3. Awareness	3.451	1.186	−.060**	−.027*			
4. Positive affective ties	3.954	0.964	−.067**	−.035*	.529**		
5. Negative affective ties	1.726	0.960	.040**	.023*	−.402**	−.640**	
6. Expertise seeking	1.590	1.819	−.166**	.000	.515**	.482**	−.348**

Predictor variables have been group-mean centred to control for the grouping effect of group. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

TABLE 2B
Descriptive statistics of level-2 variables (*n* ranges from 738 to 898)

	Mean	*sd*	*1*	*2*	*3*
1. Group tenure	2.690	1.198			
2. Individual-level awareness	31.114	29.203	.130**		
3. Individual-level positive affective ties (normalized outdegree centrality)	38.742	30.897	.188**	.770**	
4. Individual-level negative affective ties (normalized outdegree)	2.193	6.673	.076*	.075*	.043

Predictor variables have been group-mean centred to control for the grouping effect of group. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

TABLE 2C
Descriptive statistics of level-3 variables (*n* = 53)

	Mean	*sd*	*1*	*2*	*3*	*4*
1. Mean group tenure	2.729	0.521				
2. Group size	17.170	10.957	−.057			
3. Average awareness across a group	3.479	0.440	.197	−.076		
4. Group-level positive affective ties	4.046	0.221	.407**	−.430**	.555**	
5. Group-level negative affective ties	1.649	0.278	−.390**	.268*	−.518**	−.732**

**Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

(2001), one of the most "convenient, yet effective" tools to evaluate common method bias in organizational research (Malhotra, Kim & Patil, 2006, p. 1865). Specifically, the lowest observed correlation coefficient was chosen as the marker variable, providing a rough estimate of the magnitude of the common method effect. Following corresponding formulas (p. 1868), corresponding coefficients and *t*-values were calculated for all the coefficients reported in Tables 2A–2C after adjusting for the influence of common method effect as estimated through the marker variable. Following Lindell and Whitney's argument, it could be concluded that common method effect, though present, did not have major threat on the validity of the study because the same significant correlations remained after the adjustment, particularly around those research variables. As a sensitivity test, the second lowest coefficient in each table was also used as a marker variable (Malhotra et al., 2006). Again the significance levels of correlation coefficients remained unchanged across the tables. This analysis offered additional support for the conclusion that the obtained statistical significance could not be accounted for by method effect alone.

Next, a null model was run to decompose the variance in the dependent variable, *expertise seeking*. Because the null model had no explanatory variables, the variance can also be considered as residual variance (Hox, 2002/2008) that existed at three levels, 2.348 at level-1, 0.789 at level-2, and 0.234 at level-3. Intraclass correlation (ICC) coefficients, which measure the level of interdependence of the data within nesting units, were calculated following Snijder and Bosker's (1999, p. 65) example. The analysis yielded a high ICC coefficient $0.789/3.371 = 0.234$ at the individual level (level-2), and $0.234/3.371 = 0.070$ at the group level (level-3). The strong clustering effect of the data at the individual level shows the need for using HLM techniques, and supports our decision to operationalize expertise seeking at the lowest level of analysis. The coefficient for the fixed effect (β_{00}) in this null model was 2.300, representing the grand mean of expertise seeking from a relationship across individuals (range = 1 to 5). The deviance score of this model was 49397.127, which was used as a baseline to evaluate significance in model improvement. This result for the null model is summarized under Model 1 in Table 3.

TABLE 3
Summary of improvement in model fit of the HLM tests

	Deviance score	No. of parameters	Change in deviance score	Level-1 pseudo R2	Level-2 pseudo R2	Level-3 pseudo R2
Model 1: Empty model	49397.127	4				
Model 2: Controls only	40285.815	20	9111.312**	.032	.086	.748
Model 3: Level-1 research variables only	17265.735	54	23020.08**	.762	.294	.966
Model 4: Levels-1–2 research variables only	17138.766	81	126.969**	.763	.459	.944
Model 5: Levels-1–3 research variables	17170.401	98	31.635	.753	.493	.906
Model 6: Significant research variables only	17171.135	53	0.734*	.761	.402	.991

*Significant at $p < .05$, **Significant at $p < .01$.

In Model 2, all the control variables at different levels of analysis were added in the analysis. Chi-square difference test of the change in deviance score showed that the change was significant: $\chi^2(16) = 49397.127 - 40285.815 = 9111.312$, $p < .01$. Following the procedures that Snijder and Bosker (1999, pp. 101–105) described, pseudo R^2s were calculated to represent the proportion of error reduction when predicting an individual outcome at level-1, and proportional error reduction when predicting a group mean at higher levels. The results showed that pseudo R^2s for Model 2 were .032 at level-1, .086 at level-2, and .748 at level-3.

In Model 3, all level-1[2] research variables, including awareness, positive affective ties, and negative affective ties, along with the two interaction terms, were included in the model. Chi-square difference test of the change in deviance score showed that the improvement in model fit was significant: $\chi^2(34) = 40285.815 - 17265.735 = 23020.08$, $p < .01$. Pseudo R^2s for Model 3 were .762 at level-1, .294 at level-2, and .966 at level-3.

In Model 4, all the level-2 research variables, including individual-level awareness, individual-level positive affective ties, and individual-level negative affective ties were included in a slope-as-outcome model. In this model, individual-level positive and negative affective ties were used as predictors of the slope that estimated the impact of awareness on expertise seeking at the lower level of analysis. Such a setup was needed to test this cross-level interaction effects stated in Hypotheses 2d and 3d. Deviance score changed significantly, $\chi^2(27) = 17265.735 - 17138.766 = 126.969$, $p < .01$. Pseudo R^2s for Model 4 were .763 at level-1, .459 at level-2, and .944 at level-3.

In Model 5, all level-3 research variables, group-level awareness, group-level positive affective ties, and group-level negative affective ties, were included, using a similar setup as Model 3 to test cross-level interaction effects

as stated in Hypotheses 2f and 3f. Deviance score did not change significantly, $\chi^2(17) = 17170.401 - 17138.766 = 31.635$, $p > .05$, meaning that variables at level-3 did not contribute much to model improvement. Pseudo R^2s for Model 5 were .753 at level-1, .493 at level-2, and .906 at level-3.

Following Snijder and Bosker's (1999) recommendation for building parsimonious models, nonsignificant estimates from Model 5 were dropped in subsequent models to avoid "overfitting" (p. 93). As anticipated, the deviance score of Model 6, increased: $\chi^2(45) = 17171.135 - 17170.401 = .734$, $p > .05$, indicating Model 6 is a more parsimonious model that fit the data equally well. Pseudo R^2s for Model 6 were .761 at level-1, .402 at level-2, and .991 at level-3.[3]

About hypothesis testing, results reported under Model 5[4] in Table 4 fully supported Hypotheses 1a, $\pi_{awareness} = .535$, $t = 27.885$, $p < .01$, 1b, $\beta_{individual\ awareness} = .010$, $t = 5.453$, $p < .01$, and 1c, $\gamma_{group\ awareness} = .247$, $t = 2.112$, $p < .05$, indicating that awareness at every level had a positive influence on expertise seeking.[5] As predicted, both positive affective ties[1], $\pi_{positive\ affective\ ties} = .410$, $t = 18.544$, $p < .01$, and negative affective ties[1], $\pi_{negative\ affective\ ties} = -.101$, $t = -3.324$, $p < .01$, at the lowest level of analysis had a significant impact on expertise seeking, albeit in opposite directions, supporting Hypotheses 2a and 3a. Hypothesis 2b, which predicted a same-level positive interaction effect between awareness and positive affective ties at level-1, was supported,

[2]To facilitate understanding, superscripts were added to the end of each variable's name to indicate the level of analysis of each predictors, with [1] for level-1 (dyadic level), [2] for level-2 (individual level), and [3] for level-3 (group level) of analysis.

[3]Building Model 6, we have also tried a model in which all the control variables were dropped given the recent debate in the research community about how the choice of control variables may sway the results. Because, in our analysis, excluding the control variables did not change the direction or the significance of the hypotheses tested, we reported in this study the model that contains the control variables.

[4]We used results from Model 5 to report hypothesis testing because this model contained results for both supported and nonsupported hypotheses, whereas Model 6 focused on significant results only.

[5]Our use of symbols for coefficients is consistent with conventional practices in multilevel modelling (see, for example, Raudenbush & Bryk, 2002). More specifically, π is the coefficient for effects at the lowest level in the analysis (level-1), β is the coefficient for level-2 effects, and γ is the coefficient for level-3 effects.

TABLE 4
Results for model testing

Fixed effect	Model 1: Empty model	Model 2: Controls only	Model 3: level-1 variables	Model 4: levels-1–2 variables	Model 5: levels-1–3 variables	Model 6: Only sig. research variables
Intercept	2.300** (0.082)	2.877** (0.075)	3.235** (0.049)	3.216** (0.049)	3.226** (0.049)	3.203** (0.046)
Different location[1]		-0.629** (0.068)	-0.069 (0.036)	-0.062 (0.036)	-0.072 (0.039)	-0.061 (0.035)
Difference in group tenure[1]		-0.148** (0.031)	-0.037* (0.018)	-0.037 (0.019)	-0.035 (0.018)	-0.036 (0.019)
Tenure[2]		0.141** (0.043)	-0.033 (0.030)	-0.065** (0.024)	-0.070** (0.024)	-0.069** (0.025)
Average group tenure[3]		0.495** (0.099)	0.125* (0.060)	0.160* (0.061)	0.085 (0.060)	0.108 (0.058)
Group size[3]		-0.025** (0.004)	-0.002 (0.002)	-0.005* (0.002)	-0.004 (0.002)	-0.002 (0.002)
H1a: Awareness[1]			0.515** (0.019)	0.519** (0.018)	0.535** (0.019)	0.522** (0.018)
H2a: Positive affective ties[1]			0.428** (0.022)	0.416** (0.022)	0.410** (0.022)	0.417** (0.023)
H2b: Awareness × positive affective ties[1]			0.109** (0.024)	0.087** (0.022)	0.081** (0.022)	0.085** (0.019)
H3a: Negative affective ties[1]			-0.095** (0.030)	-0.109** (0.030)	-0.101** (0.030)	-0.107** (0.030)
H3b: Awareness[1] × negative affective ties[1]			0.023 (0.029)	-0.008 (0.029)	-0.006 (0.029)	
H1b: Individual-level awareness[2]				0.010** (0.002)	0.010** (0.002)	0.009** (0.002)
H2c: Individual-level positive affective ties[2] (normalized outdegree)				0.003* (0.001)	0.003* (0.001)	0.004** (0.001)
H2d: Awareness[1] × individual-level positive affective ties[2]				0.001 (0.001)	0.001 (0.001)	
H3c: Individual-level negative affective ties[2]				-0.013 (0.007)	-0.014 (0.008)	
H3d: Awareness[1] × individual-level negative affective ties[2]				-0.007** (0.003)	-0.006** (0.003)	-0.008** (0.003)
H1c: Group-level awareness[3]					0.247* (0.117)	0.315** (0.113)
H2e: Group-level positive affective ties[3]					0.241 (0.214)	
H2f: Awareness[1] × group-level positive affective ties[3]					0.063 (0.132)	
H3e: Group-level negative affective ties[3]					0.089 (0.185)	
H3f: Awareness[1] × group-level negative affective ties[3]					-0.139 (0.105)	
Random effect						
level-3 residual variance	0.234	0.059	0.008	0.013	0.022	0.002
level-2 residual variance	0.789	0.721	0.557	0.427	0.400	0.472
level-1 residual variance	2.348	2.274	0.558	0.557	0.580	0.560

The superscript after each variable name designates the level of analysis of each variables, with [1] for dyadic level, [2] for individual level, [3] for group level, and [c] for cross level. The numbers in parentheses are standard errors, which can be used for calculating the t-ratios of the unstandardized regression coefficients reported immediately above. *Significant at $p < .05$, **Significant at $p < .01$.

$\pi_{\text{awareness} \times \text{dyadic positive affective ties}}$ =.081, t = 3.655, p < .01. However, Hypothesis 3b, which predicted a same-level negative interaction effect between awareness and negative affective ties, was not supported, $\pi_{\text{awareness} \times \text{negative affective ties}}$ = −.006, t = 0.199, p > .05.

At the individual level of analysis, individual-level positive affective ties[2], $\beta_{\text{individual positive affective ties}}$ =.003, t = 2.282, p < .05, had a significant positive impact on expertise seeking, providing support for Hypothesis 2c. Individual-level negative affective ties[2] did not have a significant impact on expertise seeking, rejecting Hypothesis 3c, $\beta_{\text{individual negative affective ties}}$ = −.014, t = −1.881, p > .05. In terms of cross-level interaction effects, individual positive affective ties, $\gamma_{\text{awareness} \times \text{individual positive affective ties}}$ = .001, t = 1.327, p >.05, did not have significant contextual influence on the relationship between awareness and expertise seeking, providing no support for Hypothesis 2d. Individual negative affective ties, however, had a significant cross-level interaction effect with level-1 awareness in influencing expertise seeking, $\gamma_{\text{awareness} \times \text{individual negative affective ties}}$ = −.006, t = −2.135, p < .01, supporting Hypothesis 3d. It should be noted that although some of the significant unstandardized coefficients for individual-level (level-2) coefficients are small, the proportion of error reduction at level-2 (i.e., pseudo R^2) when research variables were added to models is more than.10.

At the group level of analysis, group-level positive affective ties did not have a significant main effect on expertise seeking, $\gamma_{\text{positive affective ties}}$ = .241, t = 1.123, p >.05, rejecting Hypothesis 2e. The cross-level interaction effect was not significant, $\gamma_{\text{awareness} \times \text{density of positive affective ties}}$ = .063, t = 0.475, p >.05, either, rejecting Hypothesis 2f. Group-level negative affective ties did not have a significant main effect, $\gamma_{\text{density of negative affect}}$ = .089, t = 0.481, p >.05, nor a significant cross-level interaction effect, $\gamma_{\text{awareness} \times \text{density of negative affective}}$ ties = −.139, t = −1.333, p >.05, on expertise seeking, providing no support for Hypotheses 3e and 3f.

Together, the results fully supported the following main effects: the impact of awareness on expertise seeking at all levels (Hypotheses 1a–1c), the impact of positive affective ties on expertise seeking at level-1 and level-2 (Hypotheses 2a and 2c), and the impact of having a negative affective tie on expertise seeking within that relationship (Hypothesis 3a). The results also fully supported the following interaction effects: the same-level interaction effect between awareness and positive affective ties at level-1 (Hypothesis 2b), as well as cross-level contextual interaction effects between awareness and individual-level negative affective ties (Hypothesis 3d). Figures 1 and 2 provided visual presentations of these interaction effects.

DISCUSSION

Our research examined how awareness of expertise distribution, along with positive and negative interpersonal affective ties would influence expertise seeking. In terms of positive affective ties, expertise seekers who had more positive affective ties with the other members of the group were more likely to turn to a member of the group for expertise, especially when they sought expertise from one of their positively tied expertise providers. We found somewhat different effects for the corollary proposition about the impact of negative affective ties on expertise seeking. At the lowest level of analysis, a significant, negative impact on expertise seeking was observed but neither the total number of negative affective ties that an individual person had nor the average number of negative network ties in a group had any significant impact on expertise seeking in the final model.
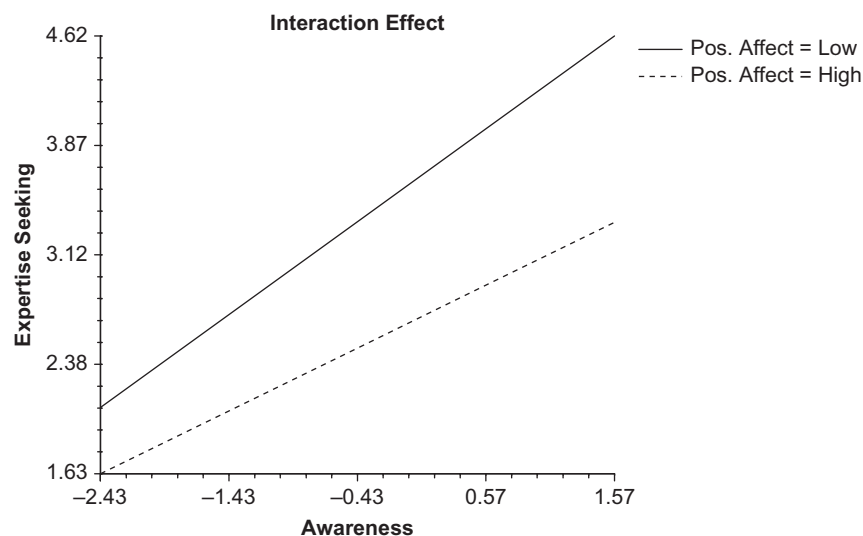

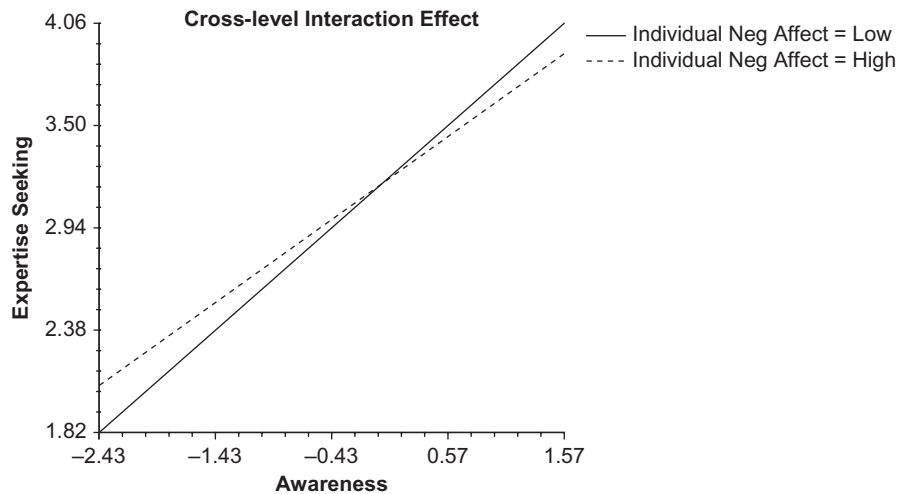**Figure 1.** Interaction effect between awareness and pasitive affective ties on expertise-seeking.

Figure 2. Cross-level moderation effect of individual-level negative affective ties on the relationship awareness and expertise-seeking.

In addition, cross-level moderation effect of total number of negative affective ties that an individual person had on the lower level relationship between awareness and expertise seeking was significant. This last result suggests that having many negative affective ties makes individuals less likely to use their awareness of expertise to direct expertise seeking, a finding that is consistent with results from existing studies about the social withdrawal tendencies of people with high negative affect (Barsade, 2002; Watson et al., 1992). This result suggests that while both positive and negative affective ties are important factors influencing expertise seeking, negative affective ties may be particularly important in terms of leveraging TM across the whole group because they influence whether or not an individual chooses to participate in an existing TM system by seeking expertise from a fellow group member. Our finding that positive and negative affective ties also have different effects on important outcomes parallels with findings from affect research that positive and negative affect have independent influences on human behaviour (e.g., Barsade, 2002).

Our findings demonstrate the value of considering TM from a multilevel perspective. We have argued that TM is a shared property that is rooted in lower level processes that occur among group members. Defining TM only as a single-level (i.e., group) property emphasizes the structural component of a TM system to the exclusion of the knowledge-relevant transactive processes, such as expertise seeking (Lewis & Herndon, 2011) behaviours by each individual group member via each individual ties. Relatedly, our findings contribute to the debate among TM scholars regarding the appropriate level of measurement (e.g., Ren & Argote, 2011). Our study suggests that measuring TM as individual-level (or relationship-level) cognition is not the same as measuring TM at the group level. Instead, TM describes a collective memory that is rooted in lower level cognitive

activities that are networked together (Monge & Contractor, 2003; Webster & Trevino, 1995; Wegner, 1986) through social relationships.

Our study demonstrates that higher level properties can influence TM at lower levels. For example, having many positive relationships influences the likelihood of seeking expertise from a known expert, even after controlling for the impact of having a direct positive tie with the expert. Similarly, having more positive relationships at the group level makes it more likely that a person will seek expertise from a particular expert, also after controlling for the impact of a direct positive tie with the expert. The fact that we did not observe a similar cross-level effect for negative relationships suggests that the effect of negative relationships may be more contained within particular pairings, presenting a challenge to theories of emotional contagion (e.g., Barsade, 2002) such that separate theories may be needed to describe different contagion processes for positive versus negative affective connections.

A final contribution of the current research is the integration of the social network and multilevel perspectives as a new framework within which to study expertise seeking and other areas of knowledge management. A handful of network researchers have recently begun to examine multilevel and cross-level effects, such as the influence of network density on knowledge transfer in teams (Brass, Galaskiewicz, Greve, & Tsai, 2004; Reagans & McEvily, 2003). However, by and large, the research efforts to date have mainly focused on within-level outcomes. Considering higher level properties may help resolve some puzzling findings. For example, Borgatti and Cross (2003) found no effect of perceived cost on the likelihood that one individual would seek information from another individual. Perhaps group-level or individual-level positive affective relationships moderated the association such that cost was not perceived as an insurmountable barrier to information

seeking within high awareness or high positive affect groups, even though it may have been a barrier in other types of teams.

Implications for practice

Our study also contributes to practice. Managers at many organizations believe that much of their needed knowledge exists inside the organization, but they have problems identifying it, finding it, and using it (Alavi & Leidner, 2001). Our finding of a significant effect of awareness at all three levels of analysis suggests that, to maximize expertise seeking, management should enact strategies that help employees develop not only awareness of the expertise held by specific others, but also their general ability to become aware of expertise, which in time can bring about additional benefit to all members in a group. For example, in addition to common management practices such as staff meetings or group-building events in which individuals share information about themselves and their expertise, managers may want to encourage all group members to receive training on engaging in productive conversations to improve awareness of each other's expertise.

Second, our results suggest that, in addition to fostering awareness, management should be mindful of the influence of affective ties on expertise seeking. According to TM theory, interdependent task relationships are crucial for expertise seeking. There is no doubt that interdependent task relationships provide strong incentives for expertise sharing (Hollingshead, 2001; Wegner, Giuliano, & Hertel, 1985; Yuan, Fulk, et al., 2010). However, our study suggests that positive affective ties can be a valuable alternative to purely task-related ties. Our results also indicate that the management should watch out for the negative influence of negative affective ties, and encourage early intervention into interpersonal conflict. Although the main effect of negative ties was contained within specific relationships in our study, the finding of significant contextual influence of negative ties show that negative ties may influence the extent to which people can leverage awareness of expertise distribution when expertise seeking.

Limitations of the study

Like many network studies, the current research is limited by the cross-sectional nature of our data. Our model assumes that awareness and affective relationships affect expertise seeking. However, we cannot rule out the possibility of reverse causality, namely, that expertise seeking predicts awareness and affective relationships, although this relationship seems far less plausible. In addition, we were able to collect data from sales groups only. Past research suggest that the nature of tasks can function as a contingency factor influencing the observation of different results (e.g., Lewis & Herndon, 2011).

Future research should recruit groups working on different types of tasks or in different functional areas (e.g., product development, manufacturing) in order to better delineate the boundaries of the results found in this study. Finally, we note that, despite our efforts to reduce concerns about potential common method bias, we cannot rule it out entirely, especially given that lower order variables were used to compile higher order variables. Given that cross-level interactions effects are least likely to be affected by common method variance, we retain confidence in our results. However, future research should validate the present findings by collecting and combining data of different types and from different sources. Results from these studies will help provide validation for our constructs.

CONCLUSION

Effective management of organizational knowledge happens when all members' individual knowledge and expertise can be accessed when needed (Lesser, 2000). Our finding that both positive and negative affective relationships significantly influenced expertise seeking above and beyond the influence of the awareness of expertise distribution suggests the importance of considering affective relationships when investigating knowledge management in general and TM in particular. The finding of a significant moderation effect of negative affective ties on lower level relationships, suggests that individuals and groups with high negative affective ties may experience difficulty leveraging TM systems. The study demonstrated the explanatory power of a multilevel model of expertise seeking that incorporates a social network perspective.

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