BARRIERS TO KNOWLEDGE SEEKING WITHIN MNC TEAMS:

WHICH DIFFERENCES MATTER MOST? *

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ABSTRACT

Taking an interpersonal perspective on knowledge flows in MNCs, we distinguish between position-based and person-based differences that can create barriers to knowledge seeking within MNC teams. Using the Social Relations Model to analyze 13,616 dyadic interactions among 2,090 members of 289 teams in a large MNC, we find that both position-based and person-based differences created barriers to knowledge seeking, but position-based differences created greater barriers than person-based differences. However, familiarity from a previous team reduced position-based barriers more than person-based barriers. These findings help explain why MNCs find it difficult to achieve the potential benefits of teams.

A central challenge in managing the multinational corporation is to promote worldwide learning by facilitating knowledge flows across the organization (Doz, Santos and Williamson, 2001; Kogut and Zander, 1993; Nohria and Ghoshal, 1997). Recognizing this, international management researchers have devoted considerable attention to examining knowledge flows between the subsidiaries of MNCs (e.g., Bjorkman, Barner-Rasmussen and Li, 2004; Gupta and Govindarajan, 2000; Jensen and Szulanski, 2004; Lord and Ranft, 2000; Minbaeva *et al*., 2003; Monteiro, Arvidsson and Birkinshaw, 2008; Noorderhaven and Harzing, 2009; Schulz, 2003). Relatively little attention, however, has been focused on knowledge flows between the individual members of MNCs, with the result that the micro-foundations of this important strategic process remain poorly understood (Foss, Husted and Michailova, 2010; Foss and Pedersen, 2004). In particular, many MNCs bring individuals from different parts of the organization and different backgrounds to work together in teams (Earley and Gibson, 2002; Shapiro, von Glinow and Cheng, 2005). A central purpose of MNC teams is to enable their members to benefit from the differences between them by sharing their knowledge with each other (Snow *et al.,* 1996). While the differences between the members of MNC teams create opportunities for learning, however, they may also create barriers to knowledge sharing.

In many MNC teams, multiple differences between members co-exist, including differences that are distinctive to MNCs as well as differences that exist in other organizations too. Prior research on MNC teams has paid particular attention to differences that arise from geographic dispersion (e.g., Cramton, 2001; Espinosa *et al*., 2003; Hinds and Mortensen, 2005), as well as from nationality diversity (e.g., Earley and Mosakowski, 2000; Hambrick *et al*., 1998; Snow *et al*., 1996). Much less research on MNC teams has addressed other differences that are less distinctive to MNCs, although these too are very common within MNCs. Reflecting the structural complexity of MNCs, team members often come from different parts of the formal organizational structure, such as different operating divisions, business units, or functional areas (cf., Bartlett, Ghoshal, and Birkinshaw, 2003; Puranam, Raveendran and Knudsen, 2012). Additionally, the demographic heterogeneity of MNCs means that team members often have different demographic attributes, for example age, tenure, or education levels (cf., Reagans, Zuckerman

and McEvily, 2004; Zenger and Lawrence, 1989). The co-existence of these various differences is important for MNC teams because each can create barriers to knowledge sharing between the members.

Despite the co-existence of multiple differences between MNC team members, most prior studies have examined the effects of specific differences separately rather than simultaneously – and the few studies that have examined the effects of several differences simultaneously have not examined them at the interpersonal level of analysis (e.g., Gibson and Gibbs, 2006 at the team level; Hansen and Lovas, 2004 at the subsidiary level). As a result, they do not fully illuminate the effects of differences that may exist between individuals. Moreover, prior research has not compared the relative effects of the various differences that may exist within MNC teams. Consequently, our understanding of which differences pose substantial barriers to knowledge sharing and which pose relatively small barriers is incomplete. This limited understanding has implications for international management scholars, who may place too much emphasis on relatively unimportant differences while neglecting more important ones, as well as for practitioners, whose ability to design and support MNC teams may suffer from incomplete insights into the challenges of knowledge sharing within them. In this paper, therefore, we aim to advance understanding of knowledge sharing in MNCs by asking: How do differences between individuals matter for knowledge sharing in MNC teams – and which differences matter most?

Since the members of a MNC team have a common purpose, they can be expected to willingly share their knowledge with each other on request (cf. Cohen and Bailey, 1997; Levine and Moreland, 1990). However, barriers to knowledge sharing may still exist if the team members avoid requesting knowledge from each other in the first place. Given this concern, we focus on *interpersonal knowledge seeking,* the critical initiating stage of a knowledge sharing process in which one member of an MNC team proactively requests task-related information, know-how, or feedback from another member of that team (cf. Borgatti and Cross, 2003; Hansen, Mors and Lovas, 2005; Monteiro *et al*., 2008).[1] To explore

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[1] Our focus on interpersonal knowledge seeking within MNC teams complements research on knowledge search across MNC subsidiaries as well as knowledge sourcing from outside MNCs (e.g., Almeida, 1996; Cantwell, 2009; Katila and Ahuja, 2002; see Laursen, 2012 for a recent review). We use the term "seeking" rather than "search" or "sourcing" to capture the more focused nature of this behavior, which targets a particular individual for knowledge.

which differences matter most for interpersonal knowledge seeking within MNC teams, we introduce a new conceptual framework for classifying the variety of differences that can characterize the members of these teams. Specifically, we distinguish between *person-based differences*, which arise from individuals' personal attributes, and *position-based differences*, which arise from individuals' situational affiliations. Drawing on theories of interpersonal communication in organizations, we suggest that both position-based and person-based differences will have negative effects on knowledge seeking between MNC team members, due to preferences for similar over dissimilar others (i.e., homophily, e.g., McPherson, Smith-Lovin and Cook, 2001) as well as concerns about communication costs (i.e., efficiency; e.g., March and Simon, 1958). Beyond this, however, we argue that position-based differences will have stronger negative effects on knowledge seeking within MNC teams than person-based differences, due to greater concerns about knowledge relevance (cf. Schulz, 2003; Yang, Mudambi, and Meyer, 2008). Additionally, we examine one possible moderator of these effects, familiarity from having worked together on a previous team, and argue that while such familiarity can mitigate the negative effects of both position-based and person-based differences, it will mitigate the effects of position-based differences more than person-based differences, because it can help overcome concerns about knowledge relevance.

We test these hypotheses with a field study of 13,616 dyadic interactions between 2,090 members of 289 teams engaged in customer service, product innovation, and operational improvement projects in a large, diversified multinational corporation in the agricultural and food industry. Consistent with our interpersonal perspective, we analyze knowledge seeking between every possible pair of MNC team members using the Social Relations Model (SRM), an advanced technique for multi-level modeling where dyadic interactions between team members are the focal unit of analysis (Kenny, Kashy and Cook, 2006). By focusing on dyadic interactions and considering the effects of position-based and person-based differences simultaneously, we are able to isolate the independent effects of these differences and also compare their relative effects on knowledge seeking. Thus, this approach enables us to identify precisely where barriers to knowledge sharing exist – and do not exist – within MNC teams.

Knowledge seeking within MNC teams is a form of task-related communication focused on acquiring information, know-how, or feedback that is potentially useful for the seeker's tasks. Extensive research on teams has shown that if one member does not proactively request information, know-how, or feedback from another, knowledge sharing often fails to occur (e.g., Stasser, 1992). Knowledge search in organizations may be initiated through a broadcast approach that involves sending out a general request to anyone who might be willing to respond (e.g., Jeppesen and Lakhani, 2010), but knowledge seeking within MNC teams is typically more targeted since willingness to respond is not a major concern. It is also often asymmetric, since one team member may seek knowledge from another without the reverse occurring (Kilduff & Krackhardt, 1994). Knowledge seeking may occur as a result of the requirements of the work – that is, due to task interdependence between team members (Galbraith, 1973; Wageman, 1995). However, our focus is on knowledge seeking that occurs voluntarily, as a result of preferences above and beyond the requirements created by task interdependence. Hence, we conceptualize interpersonal knowledge seeking within MNC teams as a voluntary, asymmetric, dyadic form of task-related communication that occurs when one member seeks out another for knowledge.

To explore the effects of member differences on knowledge seeking within MNC teams, we start by introducing our distinction between position-based and person-based differences. We then develop our hypotheses about the main and relative main effects of these differences, as well as the mitigating and relative mitigating effects of familiarity from a previous team. The hypotheses are summarized in Figure 1.

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Classifying Member Differences: Position-based and Person-based

To build a theoretical framework for our arguments, we conceptualize the differences between MNC team members as either *person-based* or *position-based*. Whereas person-based differences arise from individuals' personal attributes, position-based differences arise from individuals' situational affiliations. This conceptualization draws on the fundamental distinction in social psychology between

individuals' internal attributes and their external situations (Nisbett and Ross, 1980). It is also consistent with a distinction drawn in the sociology literature between "person-centered" and "position-centered" network ties, which arise respectively from "actors and the formal positions they occupy within a social structure" (Podolny and Baron, 1997: 676). Building on these social psychological and sociological foundations, we define person-based differences as arising from attributes of the individual that move with the person from situation to situation within the MNC, and do not change quickly or often; in contrast, we define position-based differences as arising from characteristics that depend on the situation, and can change when entering or exiting different situations within the MNC.

The result of distinguishing team member differences according to these properties is a parsimonious classification that enables a wide range of specific differences to be identified as either position-based or person-based. For example, we classify differences in geographic locations, operating divisions, business units or functional areas as position-based. Team members are typically affiliated with particular geographic locations, operating divisions, business units and functional areas in the MNC. These affiliations can change when team members are moved within the MNC, to a new location, division, business, or functional area; they can also be reversed by moving back to the former location, division, business, or functional area. In contrast, we classify differences in nationality, age, tenure, or education level as person-based. Nationality is independent of that individual's situation within the MNC, as are age, tenure, and education. These attributes move with the individual from situation to situation, and they change only very slowly if at all; those that do change are not reversible since individuals cannot move from higher to lower age groups, tenure cohorts, or education levels within the MNC.

Main Effects of Position-based and Person-based Differences

How do position-based and person-based differences influence knowledge seeking within MNC teams? Prior research on interpersonal communication within organizations has shown that two considerations are particularly important drivers of task-related communication patterns: homophily and efficiency. First, social network theory has long recognized that communication choices are strongly influenced by homophily, a tendency to associate with similar others (Lazarsfeld and Merton, 1954;

Monge and Contractor, 2003). While this tendency is sometimes due to limited options, beyond this it is due to a preference for associating with similar over dissimilar others as a result of greater interpersonal attraction (McPherson, Smith-Lovin and Cook, 2001). A wide variety of bases for homophily has been observed within organizations, including personal attributes as well as situational affiliations (e.g., Kleinbaum, Stuart and Tushman, 2013; Makela, Kalla and Piekkari, 2007; Reagans, 2011; Zellmer-Bruhn et al., 2008). Second, communication theory has emphasized the importance of efficiency, which refers to the ease of transferring information via a particular channel (e.g., Daft and Lengel, 1984; Shannon and Weaver, 1949). As March and Simon (1958: 167) stated: "the greater the communication efficiency of the channel, the greater the communication channel usage." Conversely, greater communication costs can impede information transfer within organizations (e.g., Cramton, 2001; Szulanski, 1996; Teece, 1977). Below, we propose that the mechanisms of homophily and efficiency suggest that both position-based and person-based differences can create barriers to knowledge seeking between MNC team members.

Position-based differences. Position-based differences within an MNC team arise from individuals' situational affiliations, such as their geographic locations, operating divisions, business units, or functional areas. MNC team members who work in different geographic locations, particularly different countries, often lack a shared identity and sense of trust because it is difficult for them to regularly observe each other's behaviors and attitudes, reducing their interpersonal attraction (e.g., Hinds and Mortensen, 2005; Jarvenpaa and Leidner, 1999). Working in different geographic locations can also create communication costs for MNC team members due to the limited opportunities for face-to-face interaction during their tasks (Van den Bulte and Moenaert, 1998) and the lack of richness that characterizes interaction via electronic media (Daft and Lengel, 1984), both of which can lead the team members to convey and interpret messages incompletely or inconsistently (Armstrong and Cole, 1995; Kiesler and Cummings, 2002). Likewise, belonging to different operating divisions, business units, or functional areas can also reduce interpersonal attraction and increase communication costs. Different divisions, businesses, and functions often develop divergent goals and interests (Cyert and March, 1963) as well as their own cognitive frameworks to help them define and interpret their social worlds (e.g.,

Dougherty, 1992). Thus, for example, members of a product-focused division may see an opportunity to serve a new market segment differently than those from a service-focused division, and emphasize different risks and benefits accordingly. Different divisions, businesses, and functions also frequently generate idiosyncratic terminologies as well as routines and practices that facilitate internal communication but impede communication across them (e.g., Bechky, 2003; Hoopes and Postrel, 1999; Tushman and Scanlan, 1981). The result is that "the messages emanating from one part of the organization need translation if they are to be fully effective in other parts" (Katz and Kahn, 1966: 229).

Taken together, these considerations suggest that MNC team members will be less likely to seek knowledge from those who are in different geographic locations, operating divisions, business units, or functional areas than from those in the same location, division, business, or function. Hence, we predict that the more position-based differences there are between two MNC team members, the lower the likelihood of knowledge seeking between them:

H1a: Position-based differences (in geographic locations, operating divisions, business units, and functional areas) will have negative effects on knowledge seeking between MNC team members.

Person-based differences. In contrast to position-based differences, person-based differences between MNC team members arise from individuals' personal attributes, such as their nationality, age, tenure, or education level.[2] Theories of interpersonal communication in organizations suggest that MNC team members may prefer to seek knowledge from those of the same nationality than from those of different nationalities, as well as from those of the same age, tenure, or educational level, for both homophily and efficiency reasons. Team members with the same nationality are often expected to share values, cognitive schemas, and language capabilities (Hambrick *et al*., 1998; Hofstede, 1991). Shared values encourage interpersonal communication by creating a sense of common approaches and assumptions (Makela *et al*., 2007); shared cognitive schemas increase team members' abilities to absorb

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[2] Other commonly studied personal attributes include gender and race, but we limit our focus here to those with more direct relevance to knowledge seeking in MNC teams. We conducted additional analyses with gender, and found the same pattern of results as for the other person-based differences; data on race were not available.

and process the information provided to them (Bhagat, Kedia, Harveston and Triandis, 2002); and shared language capabilities make communication easier by creating common systems of signification and mutually interpretable meanings (Brannen, 2004; Marschan-Piekkari, Welch and Welch, 1999). Individuals of the same age, meanwhile, have shared experiences of living through specific historic, economic, and political cycles that affect how they view the world and make choices, as well as the vocabularies they use to communicate (Ryder, 1965). They also tend to be at similar points in their family lives, such as looking after young children or elderly parents, further increasing the commonality in their attitudes, interests, and beliefs (Lawrence, 1987). Similarly, individuals who belong to the same tenure cohort in an organization are often exposed to shared workplace experiences such as the same entry-level training programs or change initiatives (Pfeffer, 1983; Zenger and Lawrence, 1989), and similar levels of education may signal the existence of shared values (O'Reilly, Caldwell and Barnett, 1989) as well as shared technical and social vocabularies that can facilitate communication (Tsui and O'Reilly, 1989).

These considerations together suggest that MNC team members will be less likely to seek knowledge from others who differ in nationality, age, tenure, or education than from those who share the same characteristics as themselves. Thus, we expect that the more person-based differences there are between two MNC team members, the lower the likelihood that one will seek knowledge from the other:

> *H1b: Person-based differences (in nationality, age, tenure, and education levels) will have negative effects on knowledge seeking between MNC team members.*

Relative Effects of Position-based and Person-based Differences

Although both position-based and person-based differences can create barriers to knowledge seeking between MNC team members for both homophily and efficiency reasons, we argue that position-based differences will create greater barriers than person-based differences. In addition to homophily and efficiency, a third consideration can be expected to influence knowledge seeking: the relevance of the knowledge that another team member can offer. However, this consideration does not apply equally to position-based and person-based differences. Rather, knowledge relevance will be a greater cause for

concern when deciding whether to seek knowledge from another team member with different position-based characteristics than when deciding whether to seek knowledge from another team member with different person-based characteristics, because differences in geographic location, operating division, business unit, or functional area will tend to be associated with knowledge of lower relevance to the seeker than differences in nationality, age, tenure, or education.

In MNCs, the knowledge of one party is relevant to another party the more it has implications for the other party, and the easier it is to derive these implications (Schulz, 2003; Yang *et al*., 2008). Prior research on inter-subsidiary knowledge flows in MNCs has shown that inflows of knowledge to a subsidiary depends on the relevance of the knowledge to the operations performed at that subsidiary, suggesting that knowledge follows "pathways of relevance" between subsidiaries (Schulz, 2003). At the individual level, likewise, people tend to value knowledge more highly if they perceive it as more relevant (cf. Thye, 2000). For MNC teams, the implication is that members will be less likely to seek knowledge from others whose knowledge seems potentially less relevant to themselves. The concern about knowledge relevance is particularly salient because the team members are making decisions about whom to ask for task-related information, know-how, or feedback. If, instead, they were making decisions about interactions that are not task-related, such as informal socializing (e.g., Oh, Chung and Labianca, 2004), this concern would be much less important.

The knowledge of a team member who differs in position-based characteristics will tend to seem less relevant to a seeker than the knowledge of a team member who differs in person-based characteristics because position-based characteristics typically are associated with distinctive domains of task-related expertise, whereas person-based characteristics are not. Specific locations, divisions, businesses and functions are associated with distinctive domains of task-related expertise because the formal structure of an MNC usually groups people with similar types of expertise together to create an efficient division of labor characterized by high levels of specialization (cf. Birkinshaw and Morrison, 1995; Hedlund, 1994; Zander, 1997). Additionally, people who belong to the same geographic location, operating division, business unit or functional area usually develop similar types of task-related experience over time as a

result of the tasks in which they engage as well as their shared task environment (e.g., Argote and Miron-Spektor, 2011; Cramton, 2001; Dougherty, 1991). Since position-based characteristics are associated with particular domains of task-related expertise, the knowledge of a team member in the same location, division, business or function will tend to seem highly relevant to a seeker, whereas the knowledge of a team member in a different location, division, business or function will seem much less relevant.

In contrast, nationality, age, tenure, and education level are not typically associated with distinctive domains of task-related expertise. For example, Spanish nationality is not usually associated with a particular domain of task-related expertise while French nationality is associated with a different particular domain of task-related expertise. Consequently, for a Spanish team member who is deciding from whom to seek knowledge, there is no obvious reason to be concerned about the relevance of the knowledge possessed by a French team member, simply as a result of their different nationalities. More generally, the knowledge of another team member of the same nationality, age, tenure, or education level will not usually seem much more relevant to an MNC team member than the knowledge of another team member of a different nationality, age, tenure or education level.

In summary, because the knowledge available from others who share the same position-based characteristics as themselves tends to seem more relevant, MNC team members will strongly prefer to seek knowledge from other members in the same location, division, business, or function, rather than from other members in different locations, divisions, businesses, or functions. In comparison, because relevant knowledge can be obtained from those who are different in nationality, age, tenure, or education level as well as from those of the same nationality, age, tenure, or education level, these person-based differences will be less salient as barriers to knowledge seeking. Hence, we propose that the likelihood of knowledge seeking will be lower across position-based differences than across person-based differences:

H2: Position-based differences will have stronger negative effects on knowledge seeking between MNC team members than person-based differences.

Mitigating Effects of Familiarity from a Previous Team

Are the barriers to knowledge seeking created by differences between MNC team members surmountable? To explore when team members might be more likely to overcome these barriers, we examine one potential moderator of the negative effects of differences on knowledge seeking: familiarity from having worked together on a previous team. Recent research has highlighted the importance of familiarity for facilitating communication between team members (e.g., Espinosa *et al*., 2007; Huckman, Staats and Upton, 2009; Reagans, Argote and Brooks, 2005). Familiarity from a previous team can offset homophily preferences and reduce efficiency concerns, thus helping to overcome the barriers to knowledge seeking created by both position-based and person-based differences.

Familiarity can offset homophily preferences by increasing interpersonal attraction between those who are different on position-based or person-based characteristics. Although familiarity from a previous team sometimes may lead two individuals who differ in position-based or person-based characteristics to like each other less, an increase in interpersonal attraction more commonly results, for two reasons. First, there is considerable evidence that simple contact generally increases understanding and liking between people who are different (Allport, 1954; Blau, 1977). Second, screening and socialization processes in organizations tend to lead to increased homogeneity and weed out overly dissimilar members over time (Schneider, 1987). Consequently, individuals with surface-level differences may well have deep-level similarities that are revealed through interaction opportunities and shared experiences on a previous team (cf. Harrison, Price and Bell, 1998; Phillips, Northcraft and Neale, 2006). In addition, shared experiences on a previous team can increase trust in the intentions and capabilities of others who are different, further increasing interpersonal attraction (Uzzi and Lancaster, 2003; McEvily, Perrone and Zaheer, 2003)

Prior familiarity can also reduce efficiency concerns by decreasing expected communication costs for team members who differ in position-based or person-based characteristics. Familiarity from a previous team enables individuals to build mutual knowledge − knowledge that they share in common and know they share (Cramton, 2001; Krauss and Fussell, 1990) − by providing opportunities for interaction as well as shared experiences, such as sitting in the same client meeting or suffering a project setback together (Hinds and Mortensen, 2005; Wittenbaum, 1998). This mutual knowledge helps team

members to adjust what and how they communicate, and their interpretations of the information communicated to them, according to their understanding of what others know (Cramton, 2001). Additionally, knowing what each other knows enables team members to locate and coordinate specialized expertise more efficiently (Brandon and Hollingshead, 2004; Faraj and Sproull, 2000). As a result of lesser concerns about communication costs as well as greater interpersonal attraction, the barriers to knowledge seeking created by both person-based and position-based differences may be lowered for team members who have worked together previously. Hence, we predict:

> *H3a: Familiarity from a previous team will mitigate the negative effects of position-based differences on knowledge seeking between MNC team members.*

> *H3b: Familiarity from a previous team will mitigate the negative effects of person-based differences on knowledge seeking between MNC team members.*

Relative Mitigating Effects of Familiarity from a Previous Team

Familiarity from a previous team can be expected to lower the barriers created by both position-based and person-based differences, but does it lower these barriers equally? We argue that such familiarity will lower the barriers created by position-based differences more than the barriers created by person-based differences, because it can help overcome concerns about knowledge relevance that are more salient for position-based differences than for person-based differences. In addition to offsetting homophily preferences and reducing efficiency concerns, familiarity from a previous team can mitigate the negative effects of differences on knowledge seeking by helping team members to gain insight into the potential relevance of each other's knowledge. Since concerns about knowledge relevance are greater for position-based differences than person-based differences, this insight is particularly valuable for reducing the barriers to knowledge seeking created by position-based differences.

When two team members from different geographic locations, operating divisions, business units, or functional areas have familiarity from a previous team, they have more insight into the potential

relevance of each other's task-related knowledge through their prior work together (cf. Hinds *et al.*, 2000; Huckman *et al*., 2009). Even if their domains of task-related expertise are quite distinctive, they will be more likely to recognize and take advantage of opportunities to learn from each other, solicit inputs that challenge their initial assumptions, or advance their thinking by seeking complementary insights, as a result of their prior familiarity (cf., Faraj and Sproull, 2000; Gruenfeld *et al.,* 1996). They also will be more likely to understand and appreciate the complementarities between their roles and responsibilities on the task as a result of their first-hand experience of working together previously (cf., Espinosa *et al*., 2007; Reagans *et al*.; 2005). Thus, prior familiarity lowers the barriers to knowledge seeking between team members from different locations, divisions, businesses or functions not only by increasing interpersonal attraction and reducing communication costs, but also by helping these team members to see how seeking knowledge from each other might be useful.

In contrast, for two team members of different nationalities, age, tenure, or education levels, the value of familiarity from a previous team for lowering the barriers between them is lower. While prior familiarity can help establish the relevance of knowledge available from team members with different person-based characteristics too, the importance of such prior familiarity is lower because their initial concerns about knowledge relevance are lower. Put differently, since person-based differences create relatively low barriers to knowledge seeking, making these barriers even lower as a result of prior familiarity has less effect on knowledge seeking. Conversely, since position-based differences create relatively high barriers to knowledge seeking, making these barriers lower has a greater effect on knowledge seeking. Thus, we propose that familiarity from a previous team is more valuable for increasing the likelihood of knowledge seeking across position-based than person-based differences:

> **H4: Familiarity from a previous team will reduce the negative effects of position-based differences more than it reduces the negative effects of person-based differences on knowledge seeking between MNC team members.**

METHODS

Research Setting and Sample

Survey participants in this study came from a large, diversified multinational corporation that has more than 100,000 employees worldwide. The MNC operates primarily in the agricultural products and services industry, including the development of ingredients and raw materials for food production. Our initial sample consisted of all 365 teams in a corporate-wide learning program; their projects centered on new product innovation, company operational improvements, and targeted customer service. Data from these MNC teams (interview data, survey data, and HR data) were collected over a two-year period from 2004 to 2006. The teams were composed by managers based on member expertise and availability, and not by the members themselves, and had completed their projects in the previous six months.

Initially, we conducted exploratory interviews with members of 18 teams to learn about the nature of their work and to develop survey questions. Members were located across the globe (65% North America, 16% Europe, 12% South America, and 6% Asia). The survey was in English since this was the official language of the MNC. Members of the 365 teams were sent an email invitation to participate in the study from the sponsoring Vice-President. The initial email message was followed up by two reminders, giving an overall survey response rate of 81% (2,179 out of 2,701), of which 2,090 respondents had complete data (77% of the sample). We limited our study to teams that had at least 4 members, and where at least 50% of the members completed the survey, reducing our final sample to 289 teams.

To provide a descriptive sense of these teams' projects as well as their composition, Table 1 presents illustrative examples of the teams included the study. This table shows that these MNC teams worked on a wide variety of customer service, operational improvement, and product innovation projects. There was also considerable variation in the geographic locations, operating divisions, business units, functional areas, nationalities, ages, tenure , and education levels of the team members.

----- Insert Table 1 about here -----

Measures

  Knowledge seeking. Following prior studies (e.g., Borgatti and Cross, 2003; Cross and

Cummings, 2004), each team member was asked regarding every other team member: "To what extent,

during the project, did you go to this person for task-relevant knowledge about work-related topics"

(knowledge seeking). The 5-point scale used the response option 1=never, 3=sometimes, 5=a lot. Survey

respondents were given a roster of the names of all team members assigned to the project, and each

respondent answered questions about every other team member. There were 8 other team members, on

average, for a total of 13,616 dyads. We followed prior research in using a single-item scale to reduce

burden on the respondents, since we were collecting fine-grained dyad-level network data. Though a

respondent seeking knowledge from a particular team member was correlated with that particular team

member seeking knowledge from the respondent ($r = .47$, $p < .001$), our focus was on the extent to which

one team member sought knowledge from another rather than the two team members' average responses.

Thus, our dependent variable is a dyad-level measure of the extent to which a respondent sought

knowledge from a particular team member.

  Position-based differences. To capture geographic locations, each respondent was asked to

report the country where they were located. Respondents reported 38 geographic locations, ranging from

Australia, Bulgaria, and China through to the U.S., Venezuela, and Zimbabwe. For each dyad that

responded to the survey, we coded for a *geographic difference* according to whether the team members

were located in the same country (0=no difference) or in different countries (1=difference).[3] In the

complex structure of this multinational corporation, each team member belonged to an operating division,

a business unit, and a functional area. Some business units operated independently while others were

within operating divisions, and some functional areas operated independently while others were shared

across business units. We used corporate records to identify the operating division and business unit of

each team member; respondents indicated their functional area in the survey. There were 15 operating

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[3] We also created an alternative continuous measure of geographic difference using distance in miles between the
country locations of the two members of a dyad; the dichotomous and continuous measures were highly correlated
(r=.69) and gave consistent results.

divisions (e.g., Agricultural Crops, Food Ingredients), 95 business units (e.g., Specific Crop, Specific Ingredient), and 16 functional areas (Accounting, Engineering, Finance, Human Resources, IT, Management, Marketing, Plant Operation, Product/ Service Support, Quality, R&D, Sales, Support, Trading, Transportation, Other). We coded for a *division difference* according to whether the two team members belonged to the same division (0=no difference) or different divisions (1=difference), for a *business difference* according to whether they belonged to the same business unit (0=no difference) or different business units (1=difference), and for a *function difference* according to whether they belonged to the same functional area (0=no difference) or different functional areas (1=difference).

To test our hypotheses, we combined these four difference variables into a cumulative measure of *position-based differences* by summing their values (range: 0 to 4). To check the robustness of our results, we also examined the effects of the component measures of geographic, division, business, and function differences separately.

Person-based differences. To capture nationalities, each respondent was asked to report their country of origin.[4] Respondents reported 67 country origins, ranging from Argentina, Belgium and Canada to Singapore, Turkey, and Ukraine. For each dyad that responded to the survey, we coded for a *nationality difference* according to whether the two team members had the same country origin (0=no difference) or different country origins (1=difference).[5] We also asked respondents to report their age, tenure, and education level in the survey. Consistent with much survey research in organizations, we used categorical response options to reduce burden and ensure comparability in survey responses; interviews prior to the survey determined the category ranges that were appropriate for the company. Age in years was measured on a 10-point scale (1: 15-20, 2: 21-25, 3: 26-30, 4: 31-35, 5: 36-40, 6: 41-45, 7: 46-50, 8: 51-55, 9: 56-60, 10: > 60 years old). Company tenure in years was measured on a 10–point scale (1: <1;

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[4] Nationality may be based on citizenship as well as origin, and the cross-cultural literature points out that individuals may have more than one nationality as well as bicultural or multicultural identities (see Leung *et al.*, 2005). While recognizing that other approaches are possible (and should yield consistent results), in this study we operationalize nationality as country of origin.

[5] Following Hansen and Lovas (2004), we also created an alternative continuous measure of nationality differences using the Hofstede dimensions of cultural distance between each dyad's countries of origin (Hofstede, 1991); the two variables were highly correlated (r = .88) and gave the same results.

2: 1–2, 3: 2–3, 4: 3–4, 5: 4–5, 6: 5–10; 7: 11–15, 8: 16–20, 9: 21–25, 10: >25 years). Education was

measured on a 6-point scale (1: high school, 2: some college, 3: bachelor's degree, 4: master's degree, 5:

professional degree, 6: doctorate). Following prior research on demographic diversity in teams (e.g., Lau

and Murnighan, 1998), we used these categories to code for an *age difference* (0=no difference,

1=difference), *tenure difference* (0=no difference, 1=difference), and *education difference* (0=no

difference, 1=difference) between each dyad in a team.[6]

As with the position-based variables, to test our hypotheses we combined these four difference

variables into a cumulative measure of *person-based differences* by summing their values (range: 0 to 4).

To check the robustness of our results, we also examined the effects of the component measures of

nationality, age, tenure, and education differences separately.

Familiarity from a previous team. Each respondent was asked if they had worked together with

each of the other team members on a previous team (0=no, 1=yes).

Control variables. Based on previous research, we identified a number of variables that could

influence the likelihood of seeking knowledge from another team member at the dyadic level of analysis.

To account for the extent to which the task required two team members to interact with each other, we

controlled for *task interdependence* ("Please indicate the extent to which, during the project, you could not

accomplish your tasks without information or materials from this person"; 1= not at all, 3= sometimes, 5=

very much). Thus, our dependent variable captures voluntary knowledge seeking beyond what was required

by task interdependence. To account for the length of time that two team members had known one another,

we controlled for *years known* (1: <1, 2: 1-3, 3: 3-5, 4: 5-10, 5: >10 years). We also controlled for whether

the target was in the country of the *headquarters,* the U.S. (0=no, 1=yes) and whether the target was the

team leader (0=no, 1=yes), since these individuals might have been targeted more often for knowledge

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[6] Additionally, since age, tenure, and education differences can be conceptualized in various ways, we constructed two alternative directional measures to capture whether the seeker was older, more experienced, or more educated than the target, and whether the seeker was younger, less experienced, or less educated than the target. We also constructed an alternative distance measure to capture the extent of the differences in age, tenure, and education between the seeker and target. These alternative measures gave the same patterns of results as the dichotomous measures (that is, however measured, the person-based variables were weaker than the position-based variables).

seeking. Because team members might have been less likely to seek knowledge from each other if they sought more knowledge from outside the team, we controlled for *external knowledge seeking* (1=never, 3= sometimes, 5=a lot). To account for the possibility that physical proximity between two team members might have led to greater knowledge seeking, we controlled for co-location by coding whether the two team members were in the same or different sites in the same country (0=same, 1=different site).[7] Finally, at the team level of analysis, we included control variables for project type (product innovation, 0=no, 1=yes; operational improvement, 0=no, 1=yes; customer service, 0=no, 1=yes; these were mutually exclusive categories), team size (number of team members), and project length (in logged months).

Statistical Approach

We used the Social Relations Model (Kenny *et al.*, 2006) to test our hypotheses. SRM is an advanced form of Hierarchical Linear Modeling, or HLM (sometimes referred to as multi-level modeling or random coefficient modeling; see Bryk and Raudenbush, 1992; Singer and Willett, 2003). Whereas HLM can account for non-independent observations due to simple hierarchical nesting, such as individuals within groups within organizations, SRM accounts for non-independent observations due to more complex forms of nesting, such as dyads nested within two members within a team (e.g., the seeker and the target). In computing the significance levels of dyad-level effects in the statistical models (e.g., the position-based and person-based differences variables), SRM uses the correctly adjusted degrees of freedom when predicting knowledge seeking. Intuitively, the dyads are treated as "repeated measures" within team members, thus maximizing power in the nested models and allowing us to assess factors that predict how dyads differ from one another within a team.

Furthermore, SRM is particularly well-suited to testing hypotheses at the dyadic level because it accurately identifies the effects of dyad-level factors while inherently controlling for reciprocity between the "actor" and the "partner" in addition to individual-level and group-level factors. Thus, SRM explicitly models variance associated with random effects for the individual seeker and the individual target who

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[7] By including this different site variable along with the geographic difference variable based on different country locations, the base condition for comparison becomes dyads in the same site in the same country.

make up a dyad, as well as the group variance and dyadic variance. In our dataset, using SAS v9.3 (PROC MIXED), we ran SRM with a NULL model (i.e., no independent variables), where knowledge seeking was the dependent variable. The NULL model indicated the following variance components for knowledge seeking: 17% seeker variance, 16% target variance, 6% seeker-target variance, 2% group variance, 31% dyadic variance, and 28% residual. This variance decomposition shows that knowledge seeking is explained by factors at multiple levels of analysis, and that the majority of variance is accounted for by dyad-level factors. Thus, the NULL model reinforces that the dyad-level approach is especially valuable for understanding knowledge seeking within MNC teams.

Following standard practice, we team-mean centered the data at the dyadic level to facilitate interpretation of the results (Hofmann and Gavin, 1998), so that the intercept reflects the expected value of knowledge seeking for the "average" dyad on a team. We also standardized the data (i.e., set the standard deviation to one) to enable direct comparisons of the coefficient sizes for the independent variables. To test the magnitude and direction of differences in coefficient sizes for H2 and H4, we followed the approach recommended by Singer and Willett (2003, pg. 123) and conducted a General Linear Hypothesis (GLH) test for each pair of coefficients.

RESULTS

Descriptive statistics for the study variables are shown in Table 2. Our key dependent variable, knowledge seeking, had a mean of 3.21 (standard deviation of 1.35) on a 5-point scale. This indicates that there was considerable variation in knowledge seeking between dyads within a team. Knowledge seeking was correlated $r = .14$ with the target being a team leader, $r = .08$ with seeking knowledge outside the team, and $r = -.09$ with team size, indicating that members sought knowledge disproportionately from the leader of their team, were more likely to seek knowledge inside the team when they also sought knowledge outside the team, and were more likely to seek knowledge from each other when the team was smaller. Task interdependence was correlated $r = .64$ with knowledge seeking, reinforcing the importance of controlling for the extent to which the task required interaction between two team members.

Additionally, years known was correlated r = .23 with knowledge seeking, underscoring the value of controlling for how long two members had known one another.

----- insert Table 2 about here -----

Main effects (H1a/b and H2)

We report the results for the main effects of differences on knowledge seeking in Table 3. Model 1 includes all the control variables, while Models 2-6 show the cumulative and component position-based difference variables in their own models. As expected, cumulative position-based differences were significantly and negatively associated with knowledge seeking (b = -.15, p < .001), as were each of the component position-based differences (geographic: b = -.21, p < .001; division: b = -.12, p < .001; business: b = -.12, p < .001; function: b = -.10, p < .001). Models 7-11 show the cumulative and component person-based difference variables in their own models. As expected, cumulative person-based differences were significantly and negatively associated with knowledge seeking (b = -.06, p < .001), as were three of the component person-based differences (nationality: b = -.08, p < .001; age: b = -.02, p < .01; tenure: b = .00, *ns*; education: b = -.04, p < .001). Model 12 shows the eight component variables entered simultaneously; in this model all four component position-based variables are significant (geographic: b = -.16, p < .001; division: b = -.04, p < .001; business: b = -.07, p < .001; function: b = -.09, p < .001) but only two of the component person-based variables are significant (nationality: b = -.02, *ns;* age: b = -.02, p < .01; tenure: b = .00, *ns*; education: b = -.03, p < .001).[8]

----- insert Table 3 about here -----

The results for H1a and H1b are shown in Model 13 in Table 3, where the cumulative position-based and person-based difference variables are entered simultaneously. This model shows that position-based differences were significantly and negatively related to knowledge seeking (b = -.15, p < .001),

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[8] We ran VIFs (variance inflation factors) on the difference variables in this model, and found that none were greater than 3.0, indicating that multicollinearity was not a substantial concern.

providing support for H1a, and also that person-based differences were significantly and negatively related to knowledge seeking (b = -.05, p < .001), supporting H1b.

Model 13 in Table 3 also shows the results for H2, which predicted stronger effects for position-based than person-based differences. In support of H2, team members with position-based differences were significantly less likely to seek knowledge from each other than team members with person-based differences (b = -.15 *vs* b = -.05; GLH test for difference in coefficient sizes p < .001). Comparing the magnitudes of the standardized coefficients, the negative effect for position-based differences is 3 times larger than for person-based differences.[9]

Moderating Effects (H3a/b and H4)

We report the results for the mitigating effects of prior familiarity in Table 4. Model 14 in Table 4 shows that prior familiarity has no significant main effect on knowledge seeking. Models 15 and 16 show that the moderating effect of familiarity from a previous team was positive and significant for position-based differences (b = .04, p < .001), and positive and marginally significant for person-based differences (b = .02, p < .10), as expected. In Model 17, where the two moderating effects are included together, the effect is significant for position-based differences (b = .04, p < .001) but not for person-based differences (b = .01, *ns*). These results indicate consistent support for H3a, which predicted that familiarity from a previous team would mitigate the negative effect of position-based differences on knowledge seeking, but only limited and weak support for H3b, which predicted that familiarity would mitigate the negative effect of person-based differences on knowledge seeking.

----- insert Table 4 about here -----

Model 17 in Table 4 also shows that familiarity from a previous team mitigated the negative effect of position-based differences to a significantly greater extent than person-based differences (b = .04 *vs* b = .01; GLH test for difference in coefficient sizes p < .001), providing support for H4. To illustrate the

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[9] This pattern of results holds for each of the component position-based versus person-based difference variable pairings in Models 3-6 versus Models 8-11, and for thirteen of the sixteen pairings in Model 12 (GLH tests for difference in coefficient sizes all p<.05, with the exception of three pairs including operating division).

moderating effect of prior familiarity on the impact of position-based and person-based differences, we plot the regression lines and compute simple slope analyses using the results from Model 17 in Table 4 (Aiken and West, 1991). As shown in Figure 2, when the dyads have no familiarity from a previous team, the slope is downward and there is a negative relationship between position-based differences and knowledge seeking (simple slope b = -.18, p<.001). However, when the dyads have familiarity from a previous team, the slope of the line is downward but there is a less negative relationship between position-based differences and knowledge seeking (simple slope b = -.12, p < .001). This indicates that for dyads with no prior familiarity, position-based differences have a stronger negative effect on knowledge seeking relative to dyads with prior familiarity. The interaction plot for person-based differences is shown in Figure 2, though the difference in slopes is not statistically significant.

----- insert Figure 2 about here -----

Additional Analyses

In additional exploratory analyses, we examined the pattern of results for the three types of projects in our sample of MNC teams separately – customer service projects, operational improvement projects, and product innovation projects. For all three types of projects, we found that both position-based differences and person-based differences had significant negative effects on knowledge seeking, but the negative effect of position-based differences was significantly stronger than the negative effect of person-based differences (Customer Service: b = -.16 *vs* b = -.06, GLH test p < .001; Operational Improvement: b = -.13 *vs* b = -.04, GLH test p < .001; Product Innovation: b = -.17 *vs* b = -.06, GLH test p < .001). Furthermore, for all three types of projects, familiarity from a previous team significantly mitigated the negative effect of position-based differences on knowledge seeking, but did not significantly mitigate the negative effect of person-based differences; and the interaction between familiarity and position-based differences was significantly stronger than the interaction between familiarity and person-based differences (Customer Service: b = .03 vs b = .01, GLH test p < .10; Operational Improvement: b = .03 *vs* b = .01, GLH test p < .01; Product Innovation: b = .05 vs b = .02, GLH test p < .05). These results

suggest that the usefulness of the distinction between position-based and person-based differences is not limited to a particular type of project.

We also conducted several additional analyses to explore for further relationships between our variables of interest. First, we looked for a two-way interaction between position-based and person-based differences, but found no evidence for such an interaction ($b = .01$, *ns*). We also looked for a three-way interaction between position-based differences, person-based differences, and prior familiarity, but again found no evidence for such an interaction ($b = .00$, *ns*). Second, we examined interactions between position-based or person-based differences and the control variables in our models. These analyses revealed one interesting significant interaction: When the target was in the headquarters country (U.S.), the negative effect of position-based differences on knowledge seeking was reduced ($b = .09$, $p < .001$), but the negative effect of person-based differences was not ($b = .02$, *ns*). This finding indicates that the barriers to knowledge seeking created by position-based differences were lower if the target was at headquarters, but the barriers created by person-based differences were not.

Third, we examined cross-level moderating effects of the overall position-based and person-based diversity of the team. The analyses revealed that team-level position-based diversity exacerbated the negative relationship between dyad-level position-based differences and knowledge seeking ($b = -.04$, $p < .001$), but team-level person-based diversity did not have an impact on the relationship between dyad-level person-based differences and knowledge seeking ($b = -.01$, *ns*). This indicates that the barriers to knowledge seeking created by position-based differences between two team members were even greater if there were more position-based differences in the team overall, but the barriers to knowledge seeking created by person-based differences were not greater if there were more person-based differences in the team overall. These results further underscore the value of distinguishing between the effects of position-based differences and person-based differences in MNC teams.

Finally, to examine performance effects, we aggregated the levels of knowledge seeking between pairs of members up to the team level to examine their effects on three member-rated measures of overall

project performance: operational, organizational, and strategic performance.[10] The measure of operational performance used a 3-item scale (rated 1-5, from Ancona and Caldwell, 1992) that captured the extent to which the project: adhered to schedules and budgets; demonstrated operational efficiency; produced excellent quality work (Cronbach's Alph a= .77, ICC1 = .14, ICC2 = .57, Rwg(j) = .82, p < .001). The measure of organizational performance used a customized 3-item scale (rated 1 to 5) that captured the extent to which the project generated learning across the organization, identified where else achievement could have impact, took advantage of other related achievements, and validated achievement by managers outside of the project (Cronbach's Alpha = .72, ICC1 = .08, ICC2 = .41, Rwg(j)= .74, p < .001). The measure of strategic performance used a customized 3-item scale (rated 1 to 5) that captured the extent to which the project: extracted potential value from the achievement, realized the maximum impact of the achievement; ensured achievement was aligned with business goals (Cronbach's Alpha = .67, ICC1 = .09, ICC2 = .43, Rwg(j) = .81, p < .001). The measures of operational and organizational performance were correlated r = .44, operational and strategic performance were correlated r = .55, and operational and strategic performance were correlated r = .59. Including team-level control variables in the models, we found that aggregate knowledge seeking in a team was significantly and positively related to the team's operational performance (b = .18, p < .001), organizational performance (b = .15, p < .01), and strategic performance (b = .16, p < .001).

DISCUSSION

In light of the importance of knowledge flows for MNCs, international management scholars have increasingly recognized the need to better understand the barriers to knowledge sharing that exist within MNCs (e.g., Doz *et al.,* 2001; Kogut and Zander, 2003). Prior research has focused primarily on national subsidiaries as the focal units between which knowledge is shared, but in this study we focus instead on knowledge sharing between the individual members of MNCs. By focusing on interpersonal

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[10] While we recognize the possibility of common-method bias in member-rated performance measures, knowledge seeking was reported at the dyad level while performance was reported at the team level, reducing its likelihood in our study. Additionally, a Harman's single-factor test for common-method bias did not indicate cause for concern.

rather than inter-subsidiary knowledge sharing, our study aims to expand understanding of the barriers

that may derail this key strategic process within MNCs. In particular, we show that multiple differences

between the members of MNC teams can create barriers to interpersonal knowledge seeking, including

not only geographic and nationality differences, as previous research on MNC teams implies, but also

differences in operating divisions, business units and functional areas as well as differences in age, tenure,

and education levels. Beyond this, moreover, our study shows that position-based differences (i.e., in

geographic locations, operating divisions, business units, and functional areas) create greater barriers to

knowledge seeking than person-based differences (i.e., in nationality, age, tenure, and education).

Additionally, we found that familiarity from a previous team reduced the negative effects of position-

based differences but not of person-based differences. Overall, these findings support our theoretical

arguments about how differences matter for knowledge seeking in MNC teams, and highlight the insights

to be gained by taking an interpersonal perspective on knowledge sharing in multinational corporations.

Implications for International Management Research and Practice

By examining interpersonal knowledge seeking between the individual members of MNC teams,

our study responds to calls to develop insight into the micro-foundations of knowledge-based processes in

the MNC (e.g., Foss *et al.,* 2010; Foss and Pedersen, 2004). We contribute to greater understanding of

these micro-foundations in three ways. First, we highlight the interpersonal barriers that may derail the

initiation of a knowledge sharing process – a crucial step that has received much less attention than the

subsequent challenges of knowledge transfer, yet without which knowledge flows may well fail to occur

(e.g., Monteiro *et al.,* 2010). Second, while prior research has offered considerable insight into the

barriers to knowledge flows between MNC subsidiaries (e.g., Foss and Pedersen, 2002; Gupta and

Govindarajan, 2000), by examining knowledge seeking at the interpersonal level rather than the inter-

subsidiary level we are able to identify numerous barriers that are typically overlooked in international

management research, such as those arising from individual differences in nationality, age, tenure, or

education levels. Third, our focus on interpersonal knowledge seeking highlights a fundamental paradox

for knowledge sharing inside MNCs. On the one hand, MNCs are likely to benefit most from knowledge

seeking between individuals who are different from each other, and thus stand to learn the most from each other (e.g., Earley and Gibson, 2002; Shapiro *et al.*, 2005). On the other hand, our findings show that individuals are less likely to seek knowledge from others who are different to them than from others who are similar to them. This helps to explain why MNCs find it so difficult to achieve the potential benefits of learning offered by their team members' diverse expertise and experience.

Our study also contributes to the literature on MNC teams, by highlighting the need to consider a wide range of differences when examining knowledge seeking between MNC team members. As illustrated in Table 1, multiple differences existed in the MNC teams we studied. In addition to geographic and nationality differences, which are relatively well studied (e.g., Hambrick et al., 1998; Hinds and Mortensen, 2005), we examined other structural differences, arising from team members' operating divisions, business units, and functional areas, as well as other demographic differences, arising from team members' age, tenure, and education levels. By showing that each of these differences matter for knowledge seeking between MNC team members, our study expands the set of differences that scholars and practitioners should view as potentially influential for the functioning of MNC teams.

Beyond showing that multiple differences matter, our study further advances understanding of MNC teams by offering a conceptual framework for predicting the relative effects of these differences, which we call the person-position framework. Group scholars have noted that understanding the relative impact of the multiple differences that often coexist within groups is an important challenge for team research (e.g., Mannix and Neale, 2005; Zellmer-Bruhn *et al.* 2008). Prior studies in the small group literature have proposed various classifications of types of diversity in groups, such as social category versus informational diversity (e.g., Jehn, Northcraft and Neale, 1999) or job-related versus non job-related diversity (Pelled, 1996). These studies have focused exclusively on distinctions within the category of person-based differences, however, whereas our person-position framework considers position-based as well as person-based differences. Additionally, they have focused mostly on how group-level diversity influences social dynamics such as conflict or cohesion, whereas we use the person-position framework to examine how dyad-level differences matter for knowledge seeking – that is, for

task-related communication. Furthermore, while the person-position framework is not necessarily limited in its applicability to MNCs, it is especially useful for studying differences within MNC teams because the range of individual differences that exists within MNCs tends to be wider than that within smaller, domestic organizations due to the scale and scope of MNCs. MNC teams are more likely to include members from different geographic locations, operating divisions, business units, and functional areas, as well as of different nationalities, ages, tenure and education levels (cf. Bartlett, *et al.*, 2003). Thus, a conceptual framework that can accommodate the full range of position-based as well as person-based differences is particularly useful for international management research.

The person-position framework is parsimonious but also comprehensive, in that a wide array of differences can be classified as either person-based or position-based. It can readily accommodate additional differences beyond those that we explored in this study, such as differences arising from regional location, time zone, or hierarchical level (position-based) and those arising from primary language, gender, or race (person-based). Moreover, our study shows the framework to be powerful for providing insight into the functioning of MNC teams, since our results revealed that the main effects of member differences on knowledge seeking, as well as the moderating effects of prior familiarity, depended on whether these differences were position-based or person-based. The person-position framework thus advances understanding of which differences pose substantial barriers to knowledge sharing and which pose relatively small barriers, highlighting the need to put studies of MNC teams that focus only on some specific barriers in the broader context of others that may matter more.

Lastly, our study also shows that familiarity from a previous team can reduce the negative effects of position-based differences on interpersonal knowledge seeking. Thus, prior familiarity can help to overcome the barriers to knowledge seeking between MNC team members who come from different geographic locations, operating divisions, business units, and functional areas. These findings extend prior research on MNC teams—and offer managers some hope—by demonstrating the role of familiarity in overcoming barriers that would otherwise exist between team members. They also provide further support for the usefulness of distinguishing between position-based and person-based differences by showing that

familiarity from a previous team is more useful for overcoming differences that are associated with knowledge of lower task relevance.

Limitations and Future Directions

While our study relied on a rigorous survey-based methodology, there are some limitations of the data which suggest directions for extending our findings in the future. First, the research was conducted in one MNC. This MNC operates much like most other large, distributed MNCs, and we would expect our findings to generalize to such settings. We have also aimed to establish the robustness of our results by showing that they hold for three different project types. Still, our theory and findings should be examined in other organizations. Second, we collected self-report data on interpersonal knowledge seeking rather than counts of e-mail messages, phone calls, or meetings. Although there is no reason to question the reliability of the respondents' estimates, it is likely that they averaged the amount of knowledge seeking over a project. As a result, this study cannot address changes the frequency of knowledge seeking over time, or how the value of this activity varies according to the stage of the project. Third, differences between team members can be conceptualized in terms of degree as well as type. In this study, we were able to consider degrees of difference for geography, nationality, age, tenure, education, and found results consistent with those for types of differences (see footnotes). However, we were not able to capture degrees of differences between divisions, businesses, or function, though it is conceivable, for example, that the difference between R&D and Sales was greater than that between Marketing and Sales. Capturing the more nuanced effects of such degrees of differences would be worthwhile in future research.

Our study also raises several further questions about how MNC team members seek knowledge for future investigation. For example, are the barriers to knowledge seeking inside a team the same as those outside the team? Team members are likely to encounter position-based and person-based differences when seeking knowledge from beyond the team too. On the one hand, team membership itself may act as an additional barrier to knowledge seeking from non-members. On the other hand, position-based or person-based characteristics that are shared with non-members may trump the team boundary, and possibly make knowledge seeking from outsiders easier than from insiders who are different. Another

direction to explore is the conditions under which overcoming differences is most beneficial for team performance. In the MNC teams we studied, we found that the overall level of knowledge seeking among the members was associated with operational, organizational and strategic project performance. However, the characteristics of the project itself may matter, as may the nature of the knowledge. For example, overcoming differences may be more beneficial for exploratory projects than for exploitation projects (cf. March, 1991), or for acquiring tacit knowledge that can only be obtained through interpersonal connections rather than explicit knowledge that can be obtained from written materials (cf. Nonaka & Takeuchi, 1995). Our findings on familiarity also suggest that another implication for consideration in future research is that an MNC's teams may become more effective over time as their members have more opportunities to work together on various projects, creating a positive learning spiral for the MNC to the extent that it is able to retain its employees.

Finally, a boundary condition for our arguments is our focus on a form of task-related communication, knowledge seeking. We found consistently stronger effects of position-based differences than person-based differences, and we would expect a similar pattern to hold for other forms of task-related communication. However, we did not study forms of interpersonal communication that are not task-related, such as social interaction, where person-based differences may conceivably matter more.

Conclusion

While knowledge sharing is increasingly viewed as a critical source of competitive advantage for MNCs, the international management literature has paid relatively little attention to a challenge that is both pervasive and problematic for MNCs: differences between individuals can create barriers to this important strategic process. Our findings help to illuminate the extent to which position-based and person-based differences can impede interpersonal knowledge seeking, even among individuals who are working together on a team. Ultimately, it is the aim of understanding such barriers, and how to overcome them, that makes the study of knowledge flows in multinational corporations worthwhile.

Figure 1. A person-position framework for understanding barriers to knowledge seeking within MNC teams.
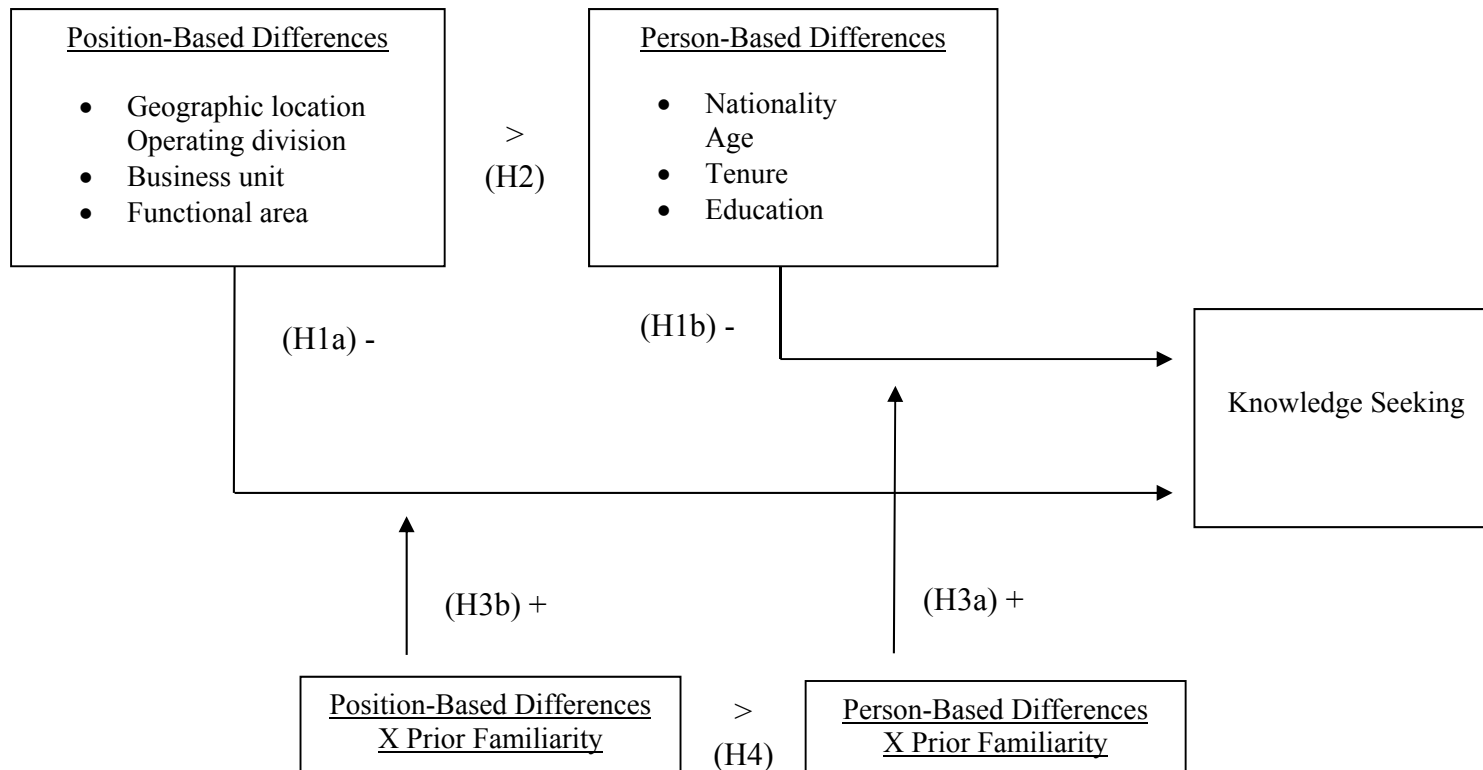
Figure 2. Interaction plots for position-based and person-based differences predicting knowledge seeking
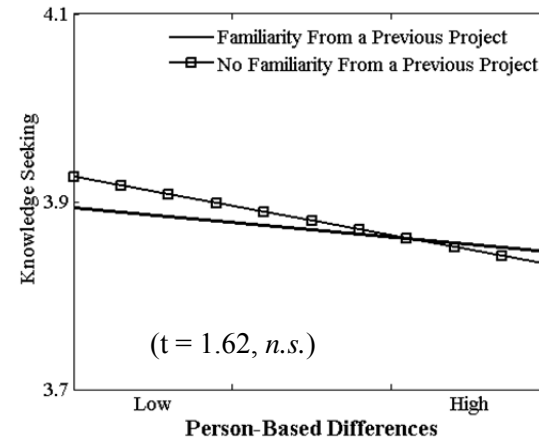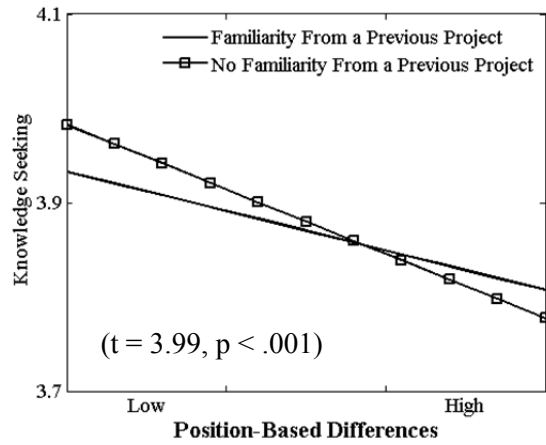
Note: The t-values reflect the difference between slopes of the two lines in each plot. For position-based and person-based differences, low is one SD below the mean and high is one SD above the mean.

Table 1. Examples of position and person-based differences across three project types (Customer Service, Operational Improvement, and Product Innovation) in the sample of N=289 MNC teams.

Project Type	Project Description	Position-Based Differences				Person-Based Differences			
		Geographic Locations	Operating Division	Business Unit	Functional Area	Nationality	Age	Tenure	Education
Customer Service	Creating new formulations of existing food ingredients for key customer	Mexico U.S.	Crop A Ingredient A	Unit A Unit B	Marketing Support Quality R&D Sales	Egypt Mexico U.S.	26-30 31-35 36-40 41-45 46-50 56-60 56-60	3-4 4-5 5-10 11-15 16-20	some college bachelors advanced
	Expanding market for crop sales by assisting customer with supply chain and technology management	Belgium Italy Germany U.S.	Food A Ingredient A Ingredient B	Unit C Unit D Unit E	Management Marketing Support Quality R&D Sales Transportation	Belgium Italy Germany U.S.	26-30 31-35 36-40 41-45 46-50 >60	2-3 3-4 4-5 5-10	< college some college bachelors masters advanced
	Helping customer to better align procurement operations with retail stores	Thailand U.S.	Corporate Food B	Unit F Unit G Unit H	Finance Management Operations Sales Transportation	U.S.	36-40 41-45 56-60 56-60 >60	5-10 11-15 16-20 21-25 >25	some college bachelors masters advanced doctorate
Operational Improvement	Executing a complex series of corporate transactions, including diverse information systems	Indonesia Singapore U.S.	Corporate Crop A	Unit F Unit I	Accounting	Australia India Malaysia Netherlands Singapore U.S.	26-30 31-35 36-40 41-45	<1 2-3 5-10 16-20	< college bachelors doctorate

	Building a corporate business around the efficient delivery of a food ingredient	Hong Kong India Mexico Netherlands Switzerland Taiwan	Crop A Food C	Unit J Unit K	Accounting I/T Management Sales Transportation	France Guatemala Hong Kong India Netherlands Switzerland Taiwan U.K.	21-25 26-30 31-35 36-40 41-45	<1 2-3 3-4 5-10 11-15 16-20 21-25	bachelors masters advanced
	Implementing a standardized corporate process for deploying I/T with a low cost of ownership	Australia Netherlands Singapore U.K. U.S.	Produce A Corporate Crop A	Unit L Unit F Unit M	I/T Management	Canada Singapore U.K. U.S.	36-40 41-45 46-50 56-60 >60	4-5 5-10 11-15 16-20 21-25 10	< college some college bachelors masters advanced
Product Innovation	Developing new food coating technology and scaled up plant for production	Belgium France Germany Italy	Ingredient B	Unit N	Accounting Finance HR Marketing Quality R&D	Belgium France Germany Italy	36-40 41-45 56-60 56-60	1-2 2-3 3-4 11-15 16-20	< college bachelors advanced doctorate
	Producing a new food storage technology and applying it to several businesses	Argentina	Crop A	Unit O	Engineering Management Operations Transportation	Argentina Uruguay	36-40 41-45 46-50 56-60	5-10 11-15 16-20 21-25 >25	< college some college bachelors advanced
	Introducing technology to create beverages using a new food ingredient	Belgium Netherlands U.S.	Food A Corporate Ingredient A Ingredient B	Unit P Unit F Unit D Unit Q Unit E	Management Support R&D Sales	Argentina France Netherlands U.K. U.S.	26-30 36-40 41-45 46-50	<1 1-2 2-3 4-5 5-10 11-15 16-20	bachelors masters advanced doctorate

Table 2. Descriptive statistics for study variables.

#	Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	Knowledge Seeking	3.2	1.3	1.0	-.19	-.10	-.13	-.13	-.11	-.08	-.06	-.03	-.04	-.04	.00	-.02	.14	.08	.64	.23	-.08	-.01	.04	-.03	-.09
2	Position-Based Diffs	1.5	1.1	-.19	1.0	.44	.79	.80	.46	.16	.26	-.01	.03	.05	.06	-.10	.01	.08	-.11	-.23	-.08	.05	-.09	.06	.04
3	Geographic	.17	.37	-.10	.44	1.0	.14	.13	-.01	.33	.59	-.04	.02	.07	-.01	-.34	.01	.04	-.08	-.13	-.39	.03	-.05	.02	.09
4	Division	.26	.44	-.13	.79	.14	1.0	.74	.05	.04	.10	-.01	.00	.00	.07	-.01	.00	.09	-.08	-.18	-.01	.08	-.07	.00	.05
5	Business	.38	.49	-.13	.80	.13	.74	1.0	.06	.05	.07	.00	.03	-.01	.07	.07	-.01	.07	-.07	-.19	.00	.03	-.06	.04	.05
6	Function	.69	.46	-.11	.46	-.01	.05	.06	1.0	.03	-.02	.01	.01	.06	.01	-.01	.01	.01	-.05	-.08	.13	-.03	-.06	.10	-.08
7	Person-Based Diffs	2.5	.92	-.08	.16	.33	.04	.05	.03	1.0	.56	.46	.50	.59	-.01	-.17	.00	.02	-.06	-.12	-.16	.05	-.05	.00	.02
8	Nationality	.31	.46	-.06	.26	.59	.10	.07	-.02	.56	1.0	-.01	.01	.10	-.02	-.25	.01	.01	-.04	-.15	-.28	.09	-.05	-.03	.03
9	Age	.83	.37	-.03	-.01	-.04	-.01	.00	.01	.46	-.01	1.0	.12	.02	.00	.04	.02	.00	-.02	-.04	.03	-.01	.01	.01	-.01
10	Tenure	.80	.40	-.04	.03	.02	.00	.03	.01	.50	.01	.12	1.0	.01	.00	.00	-.01	.03	-.03	-.11	-.01	.01	.01	-.02	.02
11	Education	.62	.49	-.04	.05	.07	.00	-.01	.06	.59	.10	.02	.01	1.0	.01	-.10	-.02	.00	-.02	.05	-.04	.03	-.05	.04	-.01
12	Prior Familiarity	.12	.32	.00	.06	-.01	.07	.07	.01	-.01	-.02	.00	.00	.01	1.0	.04	.02	.03	.01	.08	.04	.04	-.02	-.01	.01
13	With Headquarters	.60	.49	-.02	-.10	-.34	-.01	.07	-.01	-.17	-.25	.04	.00	-.10	.04	1.0	.01	-.03	.03	-.09	.36	-.01	.07	-.06	.02
14	With Team Leader	.20	.40	.14	.01	.01	.00	-.01	.01	.00	.01	.02	-.01	-.02	.02	.01	1.0	-.01	.12	.02	.01	-.01	.00	.01	-.02
15	External Knowledge	2.2	1.3	.08	.08	.04	.09	.07	.01	.02	.01	.00	.03	.00	.03	-.03	-.01	1.0	.06	-.06	-.04	.03	.05	-.08	.00
16	Task Interdep.	2.9	1.4	.64	-.11	-.08	-.08	-.07	-.05	-.06	-.04	-.02	-.03	-.02	.01	.03	.12	.06	1.0	.15	-.03	.00	.02	-.03	-.08
17	Years Known	2.8	1.1	.23	-.23	-.13	-.18	-.19	-.08	-.12	-.15	-.04	-.11	.05	.08	-.09	.02	-.06	.15	1.0	-.01	-.02	-.04	.07	-.05
18	Another Site	.43	.49	-.08	-.08	-.39	-.01	.00	.13	-.16	-.28	.03	-.01	-.04	.04	.36	.01	-.04	-.03	-.01	1.0	-.01	.00	.02	-.01
19	Product Innovation	.26	.44	-.01	.05	.03	.08	.03	-.03	.05	.09	-.01	.01	.03	.04	-.01	-.01	.03	.00	-.02	-.01	1.0	-.58	-.34	-.08
20	Operational Imprvt.	.49	.50	.04	-.09	-.05	-.07	-.06	-.06	-.05	-.05	.01	.01	-.05	-.02	.07	.00	.05	.02	-.04	.00	-.58	1.0	-.57	.09
21	Customer Service	.25	.43	-.03	.06	.02	.00	.04	.10	.00	-.03	.01	-.02	.04	-.01	-.06	.01	-.08	-.03	.07	.02	-.34	-.57	1.0	-.02
22	Team Size	10.	2.5	-.09	.04	.09	.05	.05	-.08	.02	.03	-.01	.02	-.01	.01	.02	-.02	.00	-.08	-.05	-.01	-.08	.09	-.02	1.0
23	Project Length	17.	11.	.00	.04	.09	-.02	.01	.04	.05	.04	.00	.02	.05	-.02	-.12	-.01	.06	-.01	.19	-.03	.01	-.12	.14	.04

Note: |r| > .03, p< .001; N=13616 Dyads, N=2090 Members, N=289 Teams.

Table 3. Main effects for Social Relations Models predicting knowledge seeking (continued on next page).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Intercept	3.91*** (.10)	3.93*** (.10)	3.96*** (.10)	3.92*** (.10)	3.91*** (.10)	3.91*** (.10)	3.92*** (.10)	3.92*** (.10)	3.91*** (.10)	3.91*** (.10)	3.91*** (.10)	3.95*** (.10)	3.93*** (.10)
With Headquarters	-0.05 (.03)	-0.07* (.03)	-0.11** (.03)	-0.05 (.03)	-0.05 (.03)	-0.05 (.03)	-0.06 (.03)	-0.06t (.03)	-0.05 (.03)	-0.05 (.03)	-0.05 (.03)	-0.10* (.03)	-0.08* (.03)
With Team Leader	0.10*** (.01)	0.10*** (.01)	0.11*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.11*** (.01)	0.10*** (.01)
External Knowledge	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.05*** (.01)	0.06*** (.01)	0.06*** (.01)
Task Interdependence	0.75*** (.01)	0.74*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.75*** (.01)	0.74*** (.01)	0.74*** (.01)
Years Known	0.21*** (.01)	0.18*** (.01)	0.20*** (.01)	0.20*** (.01)	0.20*** (.01)	0.20*** (.01)	0.21*** (.01)	0.20*** (.01)	0.21*** (.01)	0.21*** (.01)	0.21*** (.01)	0.18*** (.01)	0.18*** (.01)
Another Site	-0.07*** (.01)	-0.07*** (.01)	-0.10*** (.01)	-0.07*** (.01)	-0.07*** (.01)	-0.06*** (.01)	-0.07*** (.01)	-0.08*** (.01)	-0.07*** (.01)	-0.07*** (.01)	-0.07*** (.01)	-0.08*** (.01)	-0.07*** (.01)
Product Innovation	-0.07 (.05)	-0.07 (.05)	-0.08 (.05)	-0.07 (.05)	-0.07 (.05)	-0.07 (.05)	-0.07 (.05)	-0.08 (.05)	-0.07 (.05)	-0.07 (.05)	-0.07 (.05)	-0.07 (.05)	-0.07 (.05)
Customer Service	-0.09 (.06)	-0.10† (.05)	-0.09 (.05)	-0.09† (.06)	-0.09† (.05)	-0.09† (.06)	-0.09 (.06)	-0.09 (.05)	-0.09 (.06)	-0.09 (.06)	-0.09 (.06)	-0.10† (.05)	-0.10† (.05)
Team Size	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)
Project Length	0.01 (.03)	0.02 (.03)	0.01 (.03)	0.02 (.03)	0.02 (.03)	0.02 (.03)	0.01 (.03)	0.01 (.03)	0.01 (.03)	0.01 (.03)	0.02 (.03)	0.02 (.03)	0.02 (.03)

Table 3. Main effects for Social Relations Models predicting knowledge seeking (continued from previous page).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Position-Based Diffs		-0.15*** (.01)											-0.15*** (.01)
Geographic			-0.21*** (.02)									-0.16*** (.02)	
Division				-0.12*** (.01)								-0.04* (.02)	
Business					-0.12*** (.01)							-0.07*** (.02)	
Function						-0.10*** (.01)						-0.09*** (.01)	
Person-Based Diffs							-0.06*** (.01)						-0.05*** (.01)
Nationality								-0.08*** (.01)				-0.02 (.01)	
Age									-0.02** (.01)			-0.02** (.01)	
Tenure										0.00 (.01)		0.00 (.01)	
Education											-0.04*** (.01)	-0.03*** (.01)	
Fit Statistic (Deviance)	37080	36825	36933	36985	36955	36966	37042	37038	37073	37080	37057	36714	36796
X^2 (Δ Deviance)		255***	147***	95***	125***	114***	38***	42***	7**	0	23***	366***	284***

Note: *** $p< .001$, ** $p< .01$, * $p< .05$, † $p<.10$. N=13616 Dyads, N=2090 Members, and N=289 Teams. Standardized coefficients from full maximum likelihood estimation with team-mean centered data. Models 2-13 are compared to Model 1 when computing the chi-square for change in deviance. Standard errors are in parentheses below each coefficient. Operational Improvement Project variable was removed as the base condition for project type.

Table 4. Interaction effects for Social Relations Models predicting knowledge seeking.

	Model 14	Model 15	Model 16	Model 17
Intercept	3.93*** (.10)	3.93*** (.10)	3.93*** (.10)	3.93*** (.10)
With Headquarters	-0.08* (.03)	-0.08* (.03)	-0.08* (.03)	-0.08* (.03)
With Team Leader	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)	0.10*** (.01)
External Knowledge	0.06*** (.01)	0.06*** (.01)	0.06*** (.01)	0.06*** (.01)
Task Interdependence	0.74*** (.01)	0.74*** (.01)	0.74*** (.01)	0.74*** (.01)
Years Known	0.18*** (.01)	0.18*** (.01)	0.18*** (.01)	0.18*** (.01)
Another Site	-0.07*** (.01)	-0.07*** (.01)	-0.07*** (.01)	-0.07*** (.01)
Product Innovation Project	-0.07 (.05)	-0.08 (.05)	-0.07 (.05)	-0.07 (.05)
Customer Service Project	-0.10† (.05)	-0.10† (.05)	-0.10† (.05)	-0.10† (.05)
Team Size	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)	-0.06*** (.01)
Project Length	0.02 (.03)	0.02 (.03)	0.02 (.03)	0.02 (.03)
Position-Based Differences	-0.15*** (.01)	-0.15*** (.01)	-0.15*** (.01)	-0.15*** (.01)
Person-Based Differences	-0.05*** (.01)	-0.05*** (.01)	-0.05*** (.01)	-0.05*** (.01)
Prior Familiarity	0.00 (.01)	-0.01 (.01)	0.00 (.01)	-0.01 (.01)
Position-Based Differences*Prior Familiarity		0.04*** (.01)		0.04*** (.01)
Person-Based Differences*Prior Familiarity			0.02† (.01)	0.01 (.01)
Fit Statistic (Deviance)	36796	36779	36792	36777
X^2 (Δ Deviance)		17***	4†	19***

Note: *** p< .001, ** p< .01, * p< .05, † p<.10. N=13616 Dyads, N=2090 Members, and N=289 Teams. Standardized coefficients from full maximum likelihood estimation with team-mean centered data. Models 15-17 are compared to Model 14 when computing the chi-square for change in deviance. Models 15 and 17 include a (non-significant) different site * prior familiarity interaction. Standard errors are in parentheses below each coefficient. Operational Improvement Project variable was removed as the base condition for project type.

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