ANTECEDENTS OF VARIATION IN KNOWLEDGE FLOWS ACROSS INTER-UNIT DYADS
WITHIN THE LARGE MULTINATIONAL CORPORATION

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Running head: Antecedents of Dyadic Knowledge Flows
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abstract

This paper presents a theoretical framework for studying knowledge sharing within the large multinational corporation from a dyadic perspective. We conceptualize the variations of knowledge flows along two dimensions – extent and reciprocity of knowledge flows – and argue that greater extent of knowledge sharing and norms of generalized reciprocity are most beneficial for the MNC. Four dyadic characteristics can influence the extent and reciprocity of knowledge flows – interdependence (competition or collaboration), social ties, reputational balance, and inter-unit similarity. We also discuss the potential interactions of interdependence with the other three dyadic characteristics and draw propositions about them.
Knowledge sharing in organizations can be defined as “the process through which one unit (e.g. group, department, or division) is affected by the experience of another”, and which “manifests itself through changes in the knowledge or performance of the recipient unit” (Argote & Ingram, 2000). Past research has established the organization as a more conducive environment for knowledge sharing as compared to the free market, making relatively easier knowledge sharing within a firm than between firms (Kogut & Zander, 1992). Further, the knowledge-based view of the firm suggests that firms’ competitive advantage depends on their ability to create, leverage, and reproduce knowledge better than competitors (Grant, 1996; Kogut & Zander, 1992, 1996; Szulanski, 1996). However, a large part of the organizational knowledge resides in individuals and groups, and is dispersed across different parts of the organization (Spencer, 1996), which makes its effective utilization a challenging and non-trivial task for many organizations (Szulanski, 1996). Scholars has focused their attention on knowledge sharing between business units in large MNCs (Gupta & Govindarajan, 2000) and among project development teams located in geographically separated subsidiaries (Haas & Hansen, 2005; Hansen, 1999, 2002; Hansen & Lovas, 2004).

Issues concerning knowledge sharing in the MNC can be approached from three perspectives: nodal, dyadic and systemic (Gupta & Govindarajan, 2000). Research to date has taken primarily a nodal perspective, focusing on the characteristics of organizational units (OUs) that affect knowledge acquisition and knowledge diffusion (Ghoshal & Bartlet, 1988; Kogut & Zander, 1992, 1993; Teece, 1977), conditions and factors determining knowledge inflows and knowledge outflows (Gupta & Govindarajan, 1991, 2000; Zander & Kogut, 1995), as well as performance implications of knowledge sharing for the focal unit (Haas & Hansen, 2005; Hansen, 1999; Zander & Kogut, 1995). Also, researchers have conceptualized the MNC as an inter-unit network for knowledge sharing (Hansen, 2002; Schultz, 2001; Tsai, 2001, 2002) and have studied the effects of a unit’s network position on its knowledge-related interactions with other OUs (Reagans & McEvily, 2003; Schultz, 2003; Tsai, 2002).

Whereas all these studies have shed light on the factors that influence knowledge sharing, surprisingly little empirical or conceptual work has examined the process of knowledge sharing at dyadic level (see Hansen and Lovas, 2004 for a notable exception). Let us imagine a MNC with 20 units, which comprise 190
potential dyads. Arguably, it is unlikely that each of these dyads would exhibit the same patterns of knowledge sharing, or even that all of them would share knowledge at all. Further, the reciprocity of knowledge sharing is likely to vary from one dyad to another. The purpose of this paper is to explain why there might be variations in the extent and reciprocity of knowledge sharing among dyads belonging to the same organization, and specifically which are the major factors that account for such variations. Analyzing knowledge sharing at dyadic level is important, because unit-specific predictors studied by previous research, while accurate and informative, may have limited predictive power as to where knowledge will actually flow. For example, the fact that a unit is highly motivated to acquire knowledge from another unit and possesses the necessary absorptive capacity does not in any way imply that a knowledge transfer will take place. Also, certain characteristics of the units may interact with characteristics of the dyad as a whole, and such interaction may change significantly the nature of knowledge sharing. Finally, analyzing knowledge sharing at dyadic level can provide some important practical implications for managers. Such an approach may help managers in large MNCs identify situations where knowledge will flow easily and where significant additional stimuli are needed.

Second, past research has often focused on factors predicting whether knowledge will be shared or not assuming that sharing knowledge is always a positive event (see Teece, 1997 for an exception). Only recently researchers have begun to explore the costs related to knowledge sharing pointing to the fact that one must account for both the benefits and the costs of knowledge sharing in order to make meaningful conclusions about its effect on organizational performance (Haas & Hansen, 2005; Hansen, 1999; Hansen, Mors & Lovas, 2005). We build on these ideas to propose that from a MNC’s perspective, knowledge sharing is good to the extent that it is needed for operational purposes but not when knowledge is shared simply to reciprocate the other party’s efforts.

Third, past research on knowledge sharing tends to assume that OUs by virtue of belonging to the same MNC are inclined to cooperate among themselves (Hansen & Haas, 2001; Kogut & Zander, 1992; Schultz, 2001; 2003). However, the fact that OUs belong to the same MNC often means that they rely on a common pool of resources, a fact that can trigger competition rather than cooperation between them.
(Galunic & Eisenhardt, 1996; Tsai, 2002). To overcome this limitation of past research, in this paper the degree of competition between OUs is considered a critical determinant of the knowledge sharing in a dyad. Further, we analyze both the direct effects of competition and cooperation between two OUs and their interactions with the key predictors of knowledge sharing identified by prior research.

In developing our theory we take into account the joint effect of the characteristics of each unit, which lead to certain cross-unit differences, and the properties of the relationship between them. Following this approach, we identify four dimensions of a knowledge-exchange relationship – interdependence, social ties, reputational balance, and inter-unit similarity. The model developed below attempts to explain both the unique contribution of each of these factors and their joint effect on the extent and reciprocity of knowledge sharing. The paper proceeds with a brief discussion of the basic theoretical concepts used in the model. Next, we discuss the influence of each dyadic characteristic – interdependence, reputational balance, inter-unit similarity, and social ties – on the efficiency and reciprocity of knowledge sharing. Finally, we elaborate on the interaction effects of interdependence with the other three characteristics. We conclude with discussion of the implications of our model for future research and practice.

**THEORETICAL BUILDING BLOCKS**

**Knowledge Flows**

Knowledge has been generally divided into two very broad categories – tacit and explicit. Explicit knowledge is knowledge that can be fully codified, such as market data or software algorithm, which is transmittable in formal, systematic language (Nonaka, 1994; Polanyi, 1966). Tacit knowledge has a personal quality, which makes it difficult to articulate in writing (Polanyi, 1966). Fully codified knowledge is easily transferable, thus its exchange is generally not problematic (Hansen, 1999). However, such knowledge rarely exists, because most of the time the transfer and application of codified knowledge entails some related tacit knowledge (Polanyi, 1966). Therefore, for the rest of this paper we assume that the knowledge shared between two OUs is characterized by at least some degree of tacitness. Although certain types of codified knowledge such as customer data, reports, templates, and other information may have no tacit component,
such data are usually available and accessible electronically throughout the MNC, and thus direct interactions between the providing and the recipient OUs are not needed for the data to be shared.

**Characteristics of Knowledge Flows**

We conceptualize knowledge flows in a dyad as a two-dimensional construct, characterized by the extent of knowledge flow as well as the reciprocity between the two units. Research on socially-embedded relationships has considered the frequency of exchange (Granoveter, 1985) and concentration (or volume) of exchange (Baker, 1994; Uzzi, 1996) to characterize the embeddedness of a dyadic relationship. Following the same logic, we define the *extent of knowledge flows* as the joint result of frequency and concentration of knowledge-based social interactions.

*Reciprocity* represents the other important characteristic of the knowledge sharing relationship (Larson, 1992; Gupta & Govindarajan, 2000; Schrader, 1991; Uzzi, 1996; von Hippel, 1987). Under some circumstances knowledge is transferred predominantly in one direction, while in other situations knowledge inflows correspond to knowledge outflows (Gupta & Govindarajan, 1991, 2000). From an OU’s perspective, it is not the same whether it will give and receive similar amounts of knowledge or knowledge will flow in one direction only, because participants in a social exchange usually expect to receive as much as they give (Blau, 1955, 1964; Gouldner, 1960; Homans, 1958). Knowledge sharing implies certain expectations about future obligations (Bourdieu, 1977; Cheal, 1988; Nahapiet & Ghoshal, 1998) and these expectations are voluntarily and implicitly agreed on rather than explicitly contracted (Blau, 1964). For example, von Hippel (1987) found that know-how trading among competitors in the U.S. steel minimill industry is governed by strong norms of reciprocity, acknowledged and agreed on by all participants.

In the case of a pair of OUs, the major question is whether they will seek to receive as much as they give in each particular knowledge transaction, or will place the emphasis on establishing long-term knowledge sharing relationship with the provision of future benefits being more important than the immediate pay-offs from each knowledge transaction. We use the terms (1) *generalized reciprocity* to denote the underlying assumption of future knowledge sharing between two OUs, no matter whether in each particular interaction...
both parties provide the same extent of knowledge, and (2) \textit{transactional reciprocity} for situations where each OU provides knowledge to comparable extent immediately, in the course of a one-time exchange.

We believe that the type of reciprocity, although not emphasized by prior research on knowledge sharing, is an important characteristic of the dyadic patterns of knowledge flows, because it helps distinguish between knowledge flows needed for operational purposes and knowledge flows that take place only to reciprocate immediately the efforts of the other unit in a dyad. This is an important distinction, given that knowledge sharing always involves certain search and transfer costs, including material costs, time commitment, cognitive and physical efforts (Hansen, Mort & Lovas, 2005; Teece, 1977). In fact, recent empirical studies demonstrate that the costs of transferring knowledge can outweigh the benefits and thus hurt a unit’s performance (Haas & Hansen, 2005; Hansen, 2002). Consequently, knowledge sharing among OUs when it is not necessary for performing a particular task at hand may be a source of inefficiency both for the dyad and for the organization as a whole. Therefore, we assume that it is more beneficial for the organization if any given dyad establishes norms of generalized rather than transactional reciprocity.

\textbf{Salient Properties of Interunit Dyads}

Knowledge transfers within the MNC depend on various factors related to the motivation and ability of its units to share knowledge (Gupta & Govindarajan, 2000; Szulanski, 1996, 2000). The relationship between two OUs is a function of both the properties of each unit and the relationship between them. Thus, the dyadic context of knowledge sharing is defined by both unit-specific and relation-specific factors. Accordingly, we conceptualize the knowledge flows in a dyad as a joint result of the nature of interactions between the units – or the relation-specific dyadic characteristics – and the cross-unit differences, based on unit-specific characteristics. Further, the relationship between two units has a formal aspect, which is determined by the organizational structure and the role of each unit within the organization, as well as an informal, or social, aspect (Scott, 2002; Stinchcombe, 1965; Thompson, 1967). The formal aspect of the dyadic relationship is expressed in the structural interdependence, determined by the goal-congruity and reward systems in the organization, which provides incentives for \textit{competition} and \textit{collaboration} between OUs.
(Wageman, 2001). The informal aspect of the relationship, on the other hand, is reflected in the existence and strength of social ties between the two units.

The cross-unit differences determined by the idiosyncratic characteristics of each unit have an objective and a subjective component. The objective source of variation – the degree of inter-unit similarity – stems from the functions and activities of each unit (Argote & Ingram, 2000) as well as both units’ geographic locations (Hansen & Lovas, 2004). The subjective source of variation among dyads reflects the differences in the units’ reputations, defined as the overall evaluations of each unit relative to the rest of the organization. The reputation of an organizational unit is an indicator of the quality of the unit’s knowledge (Hansen & Haas, 2001), because different reputations are based on the variations in past performance among OUs. At dyadic level, we use the term reputational balance to account for the cross-unit differences in reputation. We propose that each of these four factors – interdependence, social ties, interunit similarity, and reputational balance – will influence the efficiency of knowledge sharing among OUs, which in turn will impact the performance of each unit separately and of the MNC as a whole.

THE IMPACT OF DYADIC CHARACTERISTICS ON PATTERNS OF KNOWLEDGE SHARING

Competitive versus Collaborative Interdependence

Extant research on knowledge sharing tends to assume that, by virtue of belonging to the same MNC, OUs are motivated to cooperate and share knowledge. Therefore, the role of competition and collaboration has received limited attention by prior research. However, recent empirical work demonstrates that internal competition among OUs not only exists but also reduces the likelihood that they would share knowledge (Tsai, 2002) and increases the cost of knowledge transfer (Hansen et al, 2005). Whether a dyadic context will be competitive or collaborative is largely predetermined by the organizational structures of goals and tasks, as well as incentive and reward systems, which shape the differentiation and patterns of relationships among OUs (Thompson, 1967; Wageman, 2001). Both task interdependence, which refers to “features of inputs into the work itself that require multiple individuals to complete the work” (Wageman, 2001: 198), and outcome interdependence, which refers to “the degree to which outcomes such as goal attainment and tangible rewards
are contingent on collective performance” (Wageman, 2001: 201-202), can create incentives for competition or collaboration between OUs. Thus, we use the term interdependence to denote the mutual strategic positioning (competitive or collaborative) of two OUs, as determined by the tasks, goals, incentive and reward systems in the organization. The degree of both competition and collaboration can vary from low to high.

**Effect of collaboration on knowledge sharing.** Collaboration is most likely to occur between units that operate at different stages of the value chain. In such cases, each unit possesses knowledge or capabilities beneficial to but not possessed by the other unit, which makes them complementary to each other. Such units are more likely to share knowledge than other, non-complementary ones (Gulati, 1995b), because different but compatible goals stimulate cooperative interaction (Paulson, 1976). For example, in a dyad composed of a manufacturing and a marketing unit the former may teach the latter specifications of the product use/sell, while the latter may provide knowledge about customers’ preferences and tastes. Knowledge complementarity creates a clearly collaborative context for knowledge sharing, because both units can potentially benefit from it. The fact that the exchange is mutually beneficial strongly motivates both parties to share knowledge, especially if complementarity of knowledge facilitates the absorption of new knowledge (Shenkar & Li, 1999). Therefore, OUs perceiving their competences as complementary will not only share high volumes of knowledge but will also interact with each other more often.

Further, the notion that both units may benefit from sharing knowledge means that each unit will be motivated to share its knowledge regardless of whether it will receive immediate gains from a particular transaction or not. Thus, the notion that in a long run, both parties will be better off as a result of sharing knowledge is strongly present in a collaborative context. The expectation that whenever the other unit has useful knowledge, it will ‘pay back’ makes immediate gains less relevant than the prospect of future knowledge sharing. Therefore, in such a context generalized reciprocity is likely to prevail over transactional reciprocity. Based on this discussion, we propose:

**Proposition 1a:** The higher the degree of collaboration between two units, the greater the extent of knowledge flow between them.

**Proposition 1b:** The higher the degree of collaboration between two units, the more likely that their knowledge sharing relationship will be characterized with generalized reciprocity.
**Effect of competition on knowledge sharing.** Competitive interdependence reflects the competition between two OUs for access and use of a common pool of internal or external resources, especially when the business areas of the two OUs overlap (Galunic & Eisenhardt, 1996). Internally, OUs may compete for internal recognition and rewards (especially if managerial salary depends on the unit performance), key people, or financial capital. Externally, two OUs may compete for the same markets and customers (Tsai, 2002) or for access to external resources. Competition is more likely to occur between units operating in similar business areas (Galunic & Eisenhardt, 1996) and possessing substitutive knowledge (Gupta & Govindarajan, 2000; Tsai, 2002). A typical example of a competitive dyad is one comprising two manufacturing units, which are located in different countries: the two units may be in competition due to the company culture and policies or simply because of the ever present risk that, in the next round of global rationalization and manufacturing consolidation, the less efficient unit may get closed down.

High degree of competition implies that each unit can maximize its goals at the expense of the other one (Paulson, 1976), in which case each unit is strongly motivated to outperform the other one, not to help it. Most often OUs are interested in learning trade secrets or proprietary technological know-how from their competitors, but this is exactly the knowledge a competitor would strongly protect rather than share (Dyer & Nobeoka, 2000). Obviously, the unit possessing superior knowledge of any kind would not be willing to share it with its competitor. Moreover, even if for some reasons one unit would share its knowledge, the other may refuse to learn due to the substitutive nature of knowledge (Gupta & Govindarajan, 2000) or the “Not-Invented-Here” syndrome (Katz & Allen, 1982). Consequently, it could be argued that in a context of competitive interdependence, limited amount of knowledge will be shared.

Research on technology trading consistently shows that competitors would not give out knowledge if they did not expect to receive similarly valuable knowledge in return (Carter, 1989; Schrader, 1991; von Hippel, 1987). To the extent that competitively independent units are very sensitive to their resource allocation vis-a-vis competitors (Pennings, 1981), they will focus a lot on the potential for immediate gains of a knowledge sharing relationship. The major factor motivating units to share knowledge would be the expectation of receiving equal value in return. Therefore, the relatively few knowledge flows in competitive
dyads are likely to be characterized with transactional reciprocity. We summarize these ideas in the following propositions:

Proposition 2a: The higher the degree of competition between two units, the lower the extent of knowledge flow between them.

Proposition 2b: The higher the degree of competition between two units, the more likely that their knowledge sharing relationship will be characterized with transactional reciprocity.

Social Ties

Social ties as used in this paper are continuous informal relationships between two units. Since knowledge sharing is often associated with high degree of uncertainty, parties are more likely to rely on their prior partners (Burgers, Hill & Kim, 1993; Chung, Singh & Lee, 2000; Gulati, 1995a; Podolny, 1994). Often established for reducing costs and risk or exploiting other economic opportunities (Larson, 1992; Uzzi, 1996, 1997), social relationships constitute invaluable information channels that facilitate the knowledge transfer between different parts of the organization (Szulanski, 1996). Social ties reduce the search and transfer costs associated with the knowledge sharing (Granovetter, 1985; Gulati, 1995a, 1995b; Larson, 1992; Nahapiet & Ghoshal, 1998; Uzzi, 1996), make information more understandable and interpretable, “imbuing it with qualities and values that are beyond what is at hand” (Uzzi, 1996: 678), and increase the perceived reliability of knowledge provided because people tend to view information from trusted others as more credible and, thus, more important (Uzzi, 1996).

Past research have paid significant attention to the strength of social ties. Strong ties are characterized by closeness (intimacy), frequency, duration and emotional intensity (Granovetter, 1973; Marsden, 1990), which leads to development of affective, longer and more reliable relationship (Nahapiet & Ghoshal, 1998). Strong ties can affect positively individuals’ motivation to exchange knowledge (Krackhardt, 1992) because of the established heuristics for understanding each other (Uzzi, 1997). More specifically, they have been found to facilitate transfer of tacit knowledge (Hansen, 2002) and exchange of fine-grained information (Uzzi, 1997). Weak ties are of shorter duration, involve lower frequency and contact, and are more formal and less emotional (Granovetter, 1983; Aldrich, 2000). They are less reliable and the expectations concerning the other party’s performance are more uncertain in comparison to strong ties (Aldrich, 2000). Social ties have been found to be important determinants of knowledge transfer among organizational units in large corporations.
(Hansen, 1999, 2002; Hansen & Lovas, 2004; Nohria & Ghoshal, 1997; Szulanski, 1996). Weak ties speed up the search for useful knowledge and facilitate exchange of simple information but impede sharing of tacit knowledge (Hansen, 1999), whereas strong ties are useful for sharing tacit knowledge but their contribution for sharing codified knowledge is often outweighed by the costs of maintaining them (Hansen, 2002). Also, Hansen and Lovas (2004) found that project development teams always resort to their strong ties even though they are not sure if they possess the expertise required for coping with the task at hand. Therefore, strong ties are likely to increase the extent of knowledge flows in a dyad.

Further, strong ties are closely associated with tacit reciprocal arrangements (Chung et al., 2000; Gulati, 1995a; Hansen, 1999; Marsden & Campbell, 1984). For example, Aldrich defined strong ties as “two-way relationships, not governed by short-term self-interest”, which contain “an implicit principle of reciprocal obligation” (2000: 83). Strong interunit ties create conditions for “knowledge-based trust” (Shapiro, Sheppard & Cheraskin, 1992; Gulati, 1995a), e.g. parties need not to worry if they will receive exactly as much as they give in the exchange, because of the underlying assumption that the other party will conform to the expectations (Macauley, 1963) and that future interaction will follow (Good, 1988; Gulati, 1995a). Consequently, to the extent that strong ties bring familiarity and trust to the relationship between two units, they will be associated with generalized rather than transactional reciprocity. On the other hand, weak ties are more likely to seek immediate reciprocal response because of the uncertain prospects for future interactions.

Thus, unlike strong ties, weak ties are more likely to be associated with transactional reciprocity.

Proposition 3a: The stronger the social ties between two OUs, the greater the extent of knowledge flow between them.

Proposition 3b: Strong ties will be positively related to the generalized reciprocity, whereas weak ties will be positively related to transactional reciprocity.

Reputational Balance

Reputation refers to the perceived quality of social actors, based on their past performance (Fombrun & Shanley, 1990; Weigelt & Camerer, 1988). Reliable past performance in social and economic exchange is regarded as a signal of reliable future performance (Benjamin & Podolny, 1999; Kollok, 1994; Raub & Weesie, 1990; Shapiro, 1983) and, therefore, creates trust and promotes subsequent exchange (Axelrod, 1984; Hayward & Boeker, 1998). The complex and ambiguous nature of knowledge and its
uncertain relevance make reputation an important factor, because concerns with partners’ reputation tend to increase with degree of uncertainty regarding social and economic exchange (Milgrom & Roberts, 1982; Shapiro, 1982). Within the MNC, reputation is what distinguished high performers from low performers, similarly to the stratification among high and low performing firms in the organizational field (Fombrun, 1996; Rindova & Fombrun, 1999). These perceptions are particularly salient in MNC in which managers try to identify where the best practices reside (or which is the best performing unit), assuming that if a unit performs well, it must have some unique knowledge not available to others.

High reputation of a unit can influence the other unit’s perception regarding the value of its knowledge, which perception is crucial for knowledge sharing to occur (Gupta & Govindarajan, 2000). Reputation of knowledge providers for offering high quality relevant information is found to facilitate knowledge transfers by reducing search costs and allowing knowledge users to allocate their limited attention most effectively based on the reputation of knowledge suppliers (Hansen & Haas, 2001). Consequently, reputations of OUs can affect the patterns of knowledge flows in a dyad. It is important to note that previous direct interactions are not necessary for units to be aware of each other’s reputations. In fact, reputation and social ties can substitute for one another, because direct experience reduces the uncertainty and thus the concern with the other party’s reputation (Uzzi, 1996; Clark & Montgomery, 1998).

To account for both absolute and relative reputation of the two units in a dyad, we focus on the three possible conditions – both units have similarly low reputation, both units have similarly high reputation, and one of the units has higher, the other has lower reputation. Szulanski (1996) identified lack of perceived reliability of the source as one of the barriers to knowledge transfer. Clearly, if both units have low reputation, none of them will respect the other or consider the other a valuable source of knowledge. For example, if units have reputation for underperformance or inefficiency, they will see no value in exchanging knowledge with each other. Consequently, in such a situation units will avoid rather than initiate knowledge sharing. If for some reason they decide to share knowledge, in the lack of trust and respect both units will be interested in receiving immediate pay-offs. Thus, knowledge sharing between two low-reputation units is likely to be characterized with transactional reciprocity.
When one of the units has high reputation but the other – low, there are better chances for knowledge sharing to occur. The lower-reputation unit will view the other unit as a valuable source of knowledge and will be willing to learn from it. Benefits for the lower reputation unit are two-fold: first, it could learn new or better knowledge from a presumably reliable source; second, being associated with a reputable partner may help the lower-reputation unit accumulate more favorable reputation itself (Benjamin & Podolny, 1999; Stuart, 2000). On a prima face, the higher reputation unit should not be interested in exchange with a lower-reputation partner, because it could not expect to learn anything useful. However, advising may be a source of prestige for the more knowledgeable unit (Blau, 1955). Since reputation for possessing valuable knowledge is the product of social construction and validation (Fombrun & Shanley, 1990; Rao, 1994; Rindova & Fombrun, 1999), knowledge-sharing could serve to enhance the legitimacy of the providing unit and to boast its prestige for possessing unique competences (Rao, 1994). Therefore, even though a high reputation unit may neither respect a low reputation partner, nor expect to receive equally valuable knowledge in exchange, it may still be willing to give out knowledge. In such a dyad knowledge will flow predominantly in one direction, because neither the low-reputation unit has something valuable to provide, nor the high-reputation unit would be interested in learning from it.

Organizations are likely to be selective in their choice of strategic partners, in order to preserve their own reputation (Podolny, 1993; Stuart, 2000). Previous research suggests that a firm with high reputation most often would enter into a partnership with another highly-respected partner, because similarly high reputation is perceived to create fairness and commitment to the social exchange (Chung et al., 2000; Podolny, 1994). Also, in such a case both units may view the other party’s competences as valuable and worth learning. Therefore, high reputation units are likely to share more knowledge in comparison to the other two types of dyads discussed before. Also, high reputation partners are likely to behave reciprocally in order to maintain their name for being trustworthy and reliable exchange partners (Chung et al., 2000). To the extent that long-term exchange relationships are established if the partners build reputation for trustworthiness (Kollock, 1994), high reputation of both units will facilitates the notion of long-term reliability, thus making them more likely to build a generalized reciprocal relationship. Therefore, we propose that:
Proposition 4a: The extent of knowledge flow will be highest when both units have high reputation, medium when only one of the units has high reputation, and lowest when both units have low reputation.

Proposition 4b: Transactional reciprocity is most likely when both units have low reputation; generalized reciprocity is most likely when both units have high reputation; little or no reciprocity is most likely when one of the units has low and the other high reputation.

Inter-unit Similarity

Inter-unit similarity refers to the degree of overlap between core areas of expertise of units, as well as their proximity in terms of size and location. Similarity can facilitate knowledge sharing between units in several interrelated ways: by reducing uncertainty about the relevance of knowledge, increasing predictability (clear expectations), and improving mutual understanding. For example, Hansen and Lovas (2004) found that of all possible peer-units in a large MNC, a local team is most likely to contact those that are closer geographically and possess related competences.

The more similar two OUs, the more likely that the knowledge possessed by each unit would be relevant for the other one. To the extent that knowledge is embedded in individuals, groups, and patterns of interactions among them (Grant, 1996; Kogut & Zander, 1992; Spender, 1996), differences in the nature and scale of core activities can make one unit’s knowledge less applicable to the problems faced by the other unit. For example, a division of labor or patterns of interaction that fit the skills of one unit’s members may not work in another unit where members have different skills and areas of expertise (Argote & Ingram, 2000). Thus, even very efficient ways of doing things in one unit may not be applicable to another if they are too dissimilar.

Knowledge and meaning are always embedded in a social context. Thus, meaningful communication requires at least some sharing of context between OUs (Boisot, 1995; Boland & Tenkasi, 1995; Campbell, 1969). Mutual understanding based on shared language and codes facilitate knowledge sharing between people (Nahapiet & Ghoshal, 1998). As Kogut and Zander put it, “shared identity does not only lower the costs of communication, but establishes explicit and tacit rules of coordination” (1996: 502-503). Similarity is particularly beneficial for sharing tacit knowledge, because contextual information could be better understood by similar others, which makes potential misinterpretations less likely. Macauley (1963) suggests that mutual tacit understanding between managers on the conditions of an exchange is much more efficient than explicit
contracting. This observation is particularly relevant for the exchange of knowledge that is not easy to define or fully specify in a contract.

From a cognitive perspective, similarity will allow units to perceive each other as more understandable and predictable (Aldrich & Fiol, 1994; Deephouse, 1996; Suchman, 1995). Since new knowledge has uncertain relevance, OUs can try to establish formal knowledge exchange requirements (Schultz, 2001). Similarity between two units would provide them with clearer expectations of each other and will speed up the establishment of mutually acceptable codes. Thus, the more similar two OUs, the higher the level of understanding between them and the more favorable the perceptions of the other party. Consequently, similarity will facilitate knowledge sharing within the dyad and will increase the extent of knowledge flows.

The fact that inter-unit similarity tends to increase predictability and mutual understanding and to reduce uncertainty about the partner’s performance also increases the chances for the two OUs to establish a long-term relationship. Consequently, knowledge sharing between similar units is more likely to be characterized by generalized reciprocity. On the other hand, units that are too different may have more doubts concerning their partner. Therefore, they will be much more interested in the potential for immediate gains from sharing knowledge, in which case transactional reciprocity would prevail. Based on these ideas, we propose that:

Proposition 5a: The higher the inter-unit similarity, the higher the extent of knowledge flow between two OUs.

Proposition 5b: The higher the inter-unit similarity, the higher the likelihood of generalized reciprocity of knowledge sharing; the lower inter-unit similarity, the higher the likelihood of transactional reciprocity of knowledge sharing.

INTERACTIONS OF INTERDEPENDENCE WITH INTERUNIT SIMILARITY, SOCIAL TIES, AND REPUTATIONAL BALANCE

The four groups of factors discussed in the previous section coexist and thus may reinforce or negate each other’s effects. Interdependence is a contextual dyadic characteristic, in the sense that it remains relatively stable over time and units have little impact on their organizationally defined roles (e.g. two units that are competitors because of the nature of their strategic positions in the MNC could hardly change this fact without changing the scope of their core activities). The other three dyadic characteristics – reputational
balance, social ties and inter-unit similarity – are more dynamic and susceptible to development or decline over time. For example, previous relational experiences facilitate formation of future ties (Whetten, 1977); therefore, social ties between two units can become stronger during the process of knowledge sharing (Dyer & Nobeoka, 2000). Also, OUs could work for building favorable reputations based on past performance in sharing knowledge (Raub & Weesie, 1990; Rindova & Fombrun, 1999) and thus gradually change the reputational balance in the dyad. Whereas the relationships and interactions among reputation, similarity and social ties have been investigated by different bodies of research – e.g., reputation scholars have focused on the relationship between reputation and social ties (Benjamin & Podolny, 1999; Raub & Weesie, 1990), research on alliance formation has studied the relationship between reputation and interunit similarity (Chung et al., 2000), and knowledge sharing have looked at the interaction between interunit similarity and social ties (Hansen & Lovas, 2004) – there is no literature focusing on the interactions between interdependence and the other three dyadic characteristics we examined. Therefore, in this section, we discuss how reputational balance, social ties and interunit similarity moderate the effects of competition and collaboration on the extent and reciprocity of knowledge flows in a dyad within the large MNC.

The Joint Effect of Interunit Similarity and Interdependence

**Interunit similarity and competition.** The more similar two units, the more likely that they would depend on the same organizational inputs and outputs (Pennings, 1981) and would be largely substitutable (Burt, 1987). Similarity, therefore, can increase competition between units within a more competitive dyad, because a unit’s survival is a function of its resource capabilities relative to existing rivals (Porac & Thomas, 1990: 225). The fact that two competitors are similar also implies that they tap on the same resources in the environment, since critical resources are usually scarce (Pennings, 1981; Porac & Thomas, 1990). For example, firms of similar size are found to compete stronger among themselves than with other smaller or larger companies (Hannan & Freeman, 1977; Haveman, 1993). Thus, the more similar two units, the higher the competition for scarce organizational and external resources, including knowledge.

Tsai (2002) found that units competing for resources were less likely to share knowledge with each other. Since knowledge acquisition by one unit will be perceived as detracting from the knowledge of the
other, interunit similarity is most likely to prevent competitor units from exchanging sharing. Similarity is also associated with high probability of possessing substitutive knowledge (Gupta & Govindarajan, 2000), which will additionally reduce the chances of knowledge sharing to occur due to resistance to replace own knowledge with that of a competitor. Therefore, similarity will strongly reduce the efficiency of knowledge to be exchanged in a highly competitive dyad. Further, if any knowledge is transferred, competitive units would focus on the immediate transactional benefits rather than relying on future interactions. Thus, similarity between competitive units will increase the likelihood of transactional over generalized reciprocity.

**Proposition 6:** Interunit similarity will amplify (a) the negative relationship between competition and extent of knowledge flow, and (b) the prevalence of transactional over generalized reciprocity between competitive units.

**Interunit similarity and collaboration.** It is logical to expect that most knowledge would be exchanged when two units possess non-duplicative knowledge that is relevant for both parties (Gupta & Govindarajan, 2000). Knowledge uniqueness is suggested by the complementary of business activities, while relevance of knowledge is likely to depend on the degree of similarity. The effect of complementarity between units will be reinforced by the degree of similarity between them, leading to greater amount of knowledge shared. Further, similarity will increase the perception of commonality of units’ goals and values, thus enhancing the likelihood of generalized over transactional reciprocity of knowledge sharing.

**Proposition 9:** Interunit similarity will amplify (a) the positive relationship between collaboration and the extent of knowledge flow and (b) the prevalence of generalized over transactional reciprocity.

**The Joint Effect of Social Ties and Interdependence**

**Social ties and competition.** We have proposed before that competition would decrease the efficiency of knowledge sharing within a dyad. However, existence of strong ties between two units may counter-balance the negative effect of competition and increase opportunities for knowledge sharing to occur. Strong ties among competitors are found to improve organizational performance through enhanced collaboration, mitigated competition, and better information exchange (Ingram & Roberts, 2000; Uzzi, 1997). R&D researchers from competing OUs may exchange knowledge through informal networks, such as personal friendship or professional interactions at conferences and meetings (von Hippel, 1987). Similarly, Ingram and Roberts (2000) found that strong ties facilitate sharing of information about market conditions,
strategic possibilities, and operations in the Sydney hotel industry. Although sometimes such knowledge sharing may be interpreted as leakage of knowledge rather than voluntarily exchange, it is a common practice for companies to encourage their scientists or other experts to attend professional conferences and exchange ideas with peers from competitor firms. Thus, in dyads with strong ties units may share more and higher quality knowledge despite being highly competitive.

Tie strength may also increase the trust and empathy between competing units, giving room for more confidence in future reciprocation by the other party (Uzzi, 1996). Research on knowledge trading among competitor firms has found that most of them are not concerned with immediate pay-offs, because the established norms guarantee that, over a longer period of time, the exchange relationship would strike a balance between provided and received knowledge by each party (Schrader, 1991; von Hippel, 1987). Thus, strong ties can make possible the existence of generalized reciprocity even between competing OUs.

Proposition 7: Strong ties will (a) dampen the negative relationship between degree of competition and the extent of knowledge flow and (b) increase the chances for generalized reciprocity between competing OUs.

**Social ties and collaboration.** Collaborative interdependence implies complementarity of the activities, and respectively the knowledge and expertise, of two units. Research on strategic alliances have suggested that the best-case scenario for knowledge-based alliance formation is when the partners possess complementary knowledge and there are strong ties between them (Gulati, 1995b). Knowing the other party from before, in addition to knowledge complementarity, contributes to the alliance formation (Eisenhardt & Schoonhoven, 1996; Zajac & Olsen, 1993). Analogously, two units possessing complementary knowledge may develop specific routines for managing knowledge sharing on a long-term basis (Cyert & March, 1963; Gulati, 1995b; Nelson & Winter, 1982). If so, strong ties and knowledge complementarity will reinforce each other’s effect on knowledge sharing. Strong ties are more likely to facilitate knowledge sharing between complementary units than between competitor or independent units (Gulati, 1995b). Also, strong ties are likely to boast generalized reciprocity, based on trust and mutually acceptable knowledge sharing procedures (Larson, 1992).

Proposition 10: Strong ties will amplify the positive relationship between collaboration and (a) the extent of knowledge flow, and (b) generalized reciprocity of knowledge sharing in a dyad.
However, the effect of social ties might be stronger in competitive than in collaborative dyads, because as we argued collaborative dyads are characterized with high levels of knowledge flows and high likelihood of generalized reciprocity. Therefore, there is little room for increase in these characteristics that can be added by social ties. In other words, because collaboration and social ties work in the same direction, their effects might be partly redundant.

The Joint Effect of Reputational Balance and Interdependence

Reputational balance and competition. High reputations of two competitors create a situation of extreme rivalry and could even lead to “competitive wars” (Rindova, Becerra, & Contardo, 2004). OUs are likely to perceive their rivals as trying to obtain benefits at their expense, which will make them strongly protective of their own knowledge and reluctant to share it. Similarly, low reputation of both units will not in any way increase the possibility that they share knowledge, because low reputation of the other party makes its knowledge undesirable and competition further prevents them from any initiative to share knowledge. However, if one of the units has high but the other low reputation, there is some chance for knowledge sharing to occur. The high reputation unit will hardly perceive the low-reputation unit as a threat, while the latter unit may be willing to approach the former for advice or help. If this is the case, knowledge sharing will be of limited amount and mostly unidirectional (or non-reciprocal).

Proposition 8a: Balanced dyadic reputation (both OUs with either low or high reputations) will magnify the effect of competition on the extent of knowledge flow and the likelihood of transactional reciprocity of knowledge sharing.

Proposition 8b: Unbalanced dyadic reputation (one OU with high the other with low reputation) will mitigate the effect of competition on the extent of knowledge flow and the likelihood of transactional reciprocity of knowledge sharing.

Reputational balance and collaboration. Some authors suggest that if the situation is extremely correspondent (e.g. what is good for one party is also good for the other), there is no need for developing trust, so reputation becomes less relevant (Kollock, 1994). However, mutually high esteem will make parties more willing to learn from each other. Also, high reputation of two complementary units will keep partners together for a longer period of time (Larson, 1992), thus providing more opportunities for knowledge sharing. Further, when high reputation is combined with knowledge complementarity, it may lead to building strong relationship based on high level of trust (Larson, 1992), which will affect positively long-term
reciprocity. Low differences in social status has been found to increase cooperative interactions (Paulson, 1976). Consequently, two units with low reputation may share some knowledge in a highly collaborative context, contrary to the general prediction of no interactions between them. The unbalanced situation (one unit having high the other low reputation) will decrease the amount of knowledge shared between them, to the extent that knowledge will flow predominantly from the high reputation unit to the low-reputation unit. Accordingly, there will be little or no reciprocity, even in the long run.

**Proposition 11a:** Balanced and high dyadic reputation (both OUs with high reputations) will magnify the effect of collaboration on the extent of knowledge flow and generalized reciprocity of knowledge sharing.

**Proposition 11b:** Unbalanced dyadic reputation (one OU with high the other with low reputation) or balanced and low dyadic reputation (both OUs with low reputations) will reduce the effect of collaboration on the extent of knowledge flow and generalized reciprocity of knowledge sharing.

**DISCUSSION**

This paper makes several important contributions to the research on knowledge sharing within the large MNC. First, we present a theoretical framework that links the most important characteristics of a dyad, which can help predict the patterns and variations in knowledge flows among OUs. Specifically, we develop arguments about the role of interdependence (competition and collaboration), social ties, interunit similarity, and reputational balance, on the extent and reciprocity of knowledge flows in a dyad of OUs. Our focus on properties of the dyad, which are susceptible to change and it is in the power of OUs or the MNC to influence them, makes important contribution to positioning knowledge sharing as a strategic variable. Prior research has devoted extensive efforts to examining the role of knowledge characteristics, such as tacitness, stickiness, and causal ambiguity (Szulanski, 1996), which are given and cannot be developed, changed, or otherwise influenced by the OUs. The characteristics we examine, on the other hand, not only can evolve over time or in the course of knowledge sharing in a dyad, but they can be managed strategically by the OUs.

Second, we enrich extant research on knowledge sharing by focusing on both the extent and reciprocity of knowledge flows. Extent of knowledge flows is most likely to contribute to unit-level performance, whereas the reciprocity of knowledge flows, as we argued, matters more for the organizational-level efficiency. More specifically, we introduced two types of reciprocity – transactional and generalized and explain when and why each of them is more likely to occur. Prior research has looked at each instance of
knowledge transfer as a discrete event, focusing on the effects of knowledge sharing for the performance of a focal unit (Hansen & Haas, 2005). Consistent with this approach, the reciprocity of knowledge flows has remained largely overlooked. We extend past research by proposing that reciprocity is a critically important characteristics of knowledge flows in a dyad, especially if we are interested in both dyadic and organizational level benefits. We argue that generalized reciprocity is more beneficial for the MNC, because it prevents units from spending time on knowledge transfers that are not directly relevant but are rather initiated to reciprocate transfer of relevant knowledge. Although a focal unit may benefit form transactional reciprocity, such redundancy of knowledge flows could be a source of inefficiency for the MNC. On the other hand, generalized reciprocity allows for knowledge transfers to occur only when they are needed, thus increasing the efficiency of leveraging organizational knowledge. Therefore, it is important for future research to study not only whether and how much knowledge is shared but also what type of reciprocity prevails in each dyad of OUs.

Third, the paper addresses a gap in our understanding of the differences in the nature of knowledge flows in cooperative versus competitive situations. Most research to date assumes that cooperation is the default condition for units belonging to the same MNC. In contrast, we emphasize the effect of competition on knowledge sharing (Hansen et al., 2005; Tsai, 2002) and elaborate under what conditions competing OUs will share knowledge, by examining the interaction of competitive context with interunit similarity, social ties, and reputational balance. The distinction between cooperation and competition is critically important for MNCs struggling to encourage knowledge sharing among their units. Given that organizational structure and incentives are the major determinants of the degree to which any given dyad will experience competitive or collaborative interdependence, MNCs can use strategically incentives to increase (or reduce) the degree of cooperation between certain OUs for knowledge management purposes.

Fourth, we proposed three social dimensions that are relevant for analyzing knowledge sharing from a dyadic perspective. Although the concepts of social ties and similarity are not new to the literature on knowledge sharing, their impact on the process of knowledge sharing in different strategic contexts have not been studied before. We propose that the social factors have significant effect on knowledge flows in a dyad
of OUs (1) directly and (2) by influencing the relationship between competition/collaboration and the extent and reciprocity of knowledge flows. Further, we emphasize the importance of units’ reputation, which has received surprisingly little attention by prior studies. By considering the role of reputation as a predictor of knowledge flows, we account for the past performance and the desirability of the knowledge possessed by each OU.
REFERENCES


