SOCIAL CAPITAL, NETWORKS, AND KNOWLEDGE TRANSFER

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We examine how social capital dimensions of networks affect the transfer of knowledge between network members. We distinguish among three common network types: intracorporate networks, strategic alliances, and industrial districts. Using a social capital framework, we identify structural, cognitive, and relational dimensions for the three network types. We then link these social capital dimensions to the conditions that facilitate knowledge transfer. In doing so, we propose a set of conditions that promote knowledge transfer for the different network types.

Networks provide firms with access to knowledge, resources, markets, or technologies. In this article we focus on networks and how firms acquire knowledge through their positions within networks. Various scholars interested in network relationships have recognized the knowledge dimension of networks and its link with competitive success (e.g., Baum, Calabrese, & Silverman, 2000; Dyer & Nobeoka, 2000; Gupta & Govindarajan, 2000; Nishiguchi, 1994). A key argument is that, through membership in a network and the resulting repeated and enduring exchange relationships, the potential for knowledge acquisition by the network members is created. Our interest is in knowledge acquisition, how knowledge transfer between network members occurs, and what role social capital plays in the transfer.

The primary motivator for us was a theoretical gap in the research where the key concepts of networks, social capital, and organizational knowledge transfer intersect. This gap is the result of four interconnected theoretical research threads operating at an organizational level. First, there is a well-established body of literature underscoring important relationships between knowledge and networks. Second, in the network area there is increasing interest in understanding how the social context in which firms are embedded influences their behavior and performance (Gulati, Nohria, & Zaheer, 2000; Uzzi & Gillespie, 2002). Third, social capital has been identified as a concept that can add value to the study of network social processes (Lee, Lee, & Pennings, 2001; Leenders & Gabbay, 1999). Fourth, in various academic (e.g., Adler & Kwon, 2002; Gargiulo & Benassi, 2000; Nahapet & Ghoshal, 1998) and practitioner-oriented publications (e.g., Anand, Glick, & Manz, 2002; Baker, 2000), researchers recently have argued that access to new sources of knowledge is one of the most important direct benefits of social capital. Moreover, there is evidence suggesting that knowledge transfer is facilitated by intensive social interactions of organizational actors (Lane & Lubatkin, 1998; Yli-Renko, Autio, & Sapienza, 2000; Zahra, Ireland, & Hitt, 2000).

In examining these four conceptual threads, it became apparent to us that a systematic theoretical analysis of social capital and the transfer of knowledge between network members did not exist. Although various variables that affect network knowledge exchange and transfer have been posited (such as firm intent, absorptive capacity, and control systems), there are few studies that examine how the social capital dimensions of networks affect an organization's ability to acquire new knowledge from the network and facilitate the transfer of knowledge among network members. The literature on social capital identifies knowledge access as a key benefit but does not address the managerially relevant question of how social capital ac-

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tually affects knowledge transfer between network actors.

By explicitly linking social capital, networks, and knowledge transfer, we strive to achieve several objectives. The primary objective is to examine how the social capital dimensions of networks affect an organization’s ability to acquire new knowledge from the network and facilitate the transfer of knowledge among network members. A key premise is that networks create access to knowledge for the network actors. Since access is a necessary but not sufficient condition leading to transfer, we are interested in conditions that facilitate knowledge transfer.

A second objective is to integrate the diverse literature on networks and knowledge transfer. Because the network concept is broad and multidimensional, we have chosen to distinguish among three common network types: intracorporate networks, strategic alliances, and industrial districts. Using a social capital framework derived from Nahapiet and Ghoshal (1998), we identify structural, cognitive, and relational dimensions for the three network types. We then link these social capital dimensions to the conditions that facilitate knowledge transfer. In doing so, we propose a set of conditions related to knowledge transfer for the different network types.

Finally, a third objective is to help advance the study of social capital beyond that of an umbrella concept (Adler & Kwon, 2002) to a useful and valid concept with the potential for understanding network processes.

We organize the paper as follows. In the first three sections we discuss the three core concepts—namely, network types, knowledge transfer, and social capital. We then identify how the social capital dimensions are embedded in each network type. This is followed by a section in which we examine how the social capital dimensions influence knowledge transfer for the network types. Finally, we discuss implications and conclusions.

**NETWORK TYPES**

In this article we focus on strategic networks, which are composed of interorganizational ties that are enduring and of strategic significance for the firms entering them (Gulati et al., 2000). A key characteristic of networks is repeated and enduring exchange relationships between the actors in the network (Podolny & Page, 1998). This definition of networks includes a wide range of forms, including intracorporate business units, strategic alliances, franchises, R&D consortia, buyer-supplier relationships, business groups, trade associations, government-sponsored technology programs, and so on.

Figure 1 shows a typology of some common network types along two dimensions. The vertical-horizontal dimension represents the extent to which network members occupy different positions along the network’s value chain. The structured-unstructured dimension represents the extent to which network governance is structured. In a structured network, members’ roles and relationships are clearly defined, and members are well organized to achieve certain goals. The reverse is true for an unstructured network.

A challenge in studying networks is adequately specifying the boundaries of the networks (Gulati, 1995). The three network types defined below are not intended to be exhaustive in coverage. Doing so is beyond the scope of this paper. Our intent is to cover a spectrum of horizontal and vertical relationships that go from the single-node divisionalized firm (the intracorporate network) to interfirm relationships (the alliance) to an unstructured collection of firms (industrial district). As indicated by Figure 1, the three network types cover both ends of each of the two dimensions. Moreover, they are among the most researched and discussed network types. Although it is not feasible to examine all organizational network types, our discussion of multiple types raises key issues to help understand the relationships between knowledge and network types not specifically discussed.

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1 Inkpen and Beamish (1997) examine the issue of knowledge access versus knowledge transfer in detail. With a focus on alliances, the authors examine the conditions under which knowledge is transferred from one partner to another and the resulting impact on alliance stability. The authors argue that the formation of the alliance creates knowledge access for the partners, but transfer only occurs under certain conditions.

2 We thank an anonymous reviewer for suggesting the typology of networks. Note that the location and shape of each network type in the figure are approximations only.
Intracorporate Network

An intracorporate network consists of a group of organizations operating under a unified corporate identity, with the headquarters of the network having controlling ownership interest in its subsidiaries. Following Ghoshal and Bartlett (1990), we conceptualize an intracorporate network as an interorganizational grouping, rather than a unitary organization, because valuable insights on the internal structures and operations of such an entity can be gained from network-related concepts used for investigating interorganizational phenomena.

There is a clear linkage between ownership and hierarchical power in an intracorporate network. Nevertheless, the strength of the link varies greatly along several dimensions, such as the extent of decentralizing decision-making authorities to subsidiaries, the nature of the industry concerned, and the physical and cultural distances between headquarters and subsidiaries.

Strategic Alliance

A strategic alliance is a group of firms entering into voluntary arrangements that involve exchange, sharing, or codevelopment of products, technologies, or services (Gulati, 1998). The last two decades have witnessed a proliferation of strategic alliances among firms as a result of technological development and globalization. An alliance can be formed by firms located in different positions or in the same position of the value chain. In the latter case, the firms concerned may produce similar products and compete in similar geographical markets (see Hamel, Doz, & Prahalad, 1989).

It is common for firms to enter into multiple alliances with a number of partners—a phenomenon that has been called an “alliance network” (Koka & Prescott, 2002). For the sake of clear and concise exposition, we base our discussion on the context of a strategic alliance rather than a collection of alliances. That said, the issue of
knowledge transfer is conceptually the same, whether there is one alliance or multiple alliances, because it still involves knowledge moving between alliance partners. Also for clarity, we note that this context includes the complex form of alliance known as an alliance constellation, which is an alliance involving multiple firms, such as the code-sharing alliances among airlines. Although these alliances often involve quite complex design and governance, they have the same value creation logic as bilateral alliances (Das & Teng, 2002).

Industrial District

An industrial district is "a network comprising independent firms operating in the same or related market segment and a shared geographic locality, benefiting from external economies of scale and scope from agglomeration" (Brown & Hendry, 1998: 133). Some famous examples include Silicon Valley, Route 128, the Third Italy, and the City of London. An industrial district consists of a network of producers, supporting organizations, and a local labor market (Scott, 1992). There may or may not be a vertical division of labor among the producers. For instance, Storper (1993) found that clusters of firms in northeast central Italy exhibited a marked division of labor, whereas other Italian clusters comprised groups of firms doing more or less the same thing. There are usually major universities located inside or close to industrial districts. The universities train skilled personnel and provide technical and research support to firms in the districts.

KNOWLEDGE TRANSFER

We are interested in conditions that facilitate knowledge transfer in networks. Knowledge transfer is the process through which one network member is affected by the experience of another (Argote & Ingram, 2000). Knowledge transfer manifests itself through changes in knowledge or performance of the recipient unit.

In a growing body of research, scholars argue that organizations able to transfer knowledge effectively from one organizational unit to another are more productive than organizations that are less capable of knowledge transfer (e.g., Almeida & Kogut, 1999; Argote, Beckman, & Epple, 1990; Baum & Ingram, 1998; Hansen, 2002; Kostova, 1999). New knowledge, especially knowledge from outside the firm, can be an important stimulus for change and organizational improvement. Related to the network context more specifically, Kotabe, Martin, and Domoto (2003) found that organizational benefits can arise from knowledge transfer between network firms.

Gupta and Govindarajan (1991) argue that the MNC can be regarded as a network of capital, product, and knowledge transactions among units operating in different countries and that "the primary reason why MNCs exist is because of their ability to transfer and exploit knowledge more effectively and efficiently in the intracorporate context than through external market mechanisms" (Gupta & Govindarajan, 2000: 473). For each type of transaction, subsidiaries can differ in the extent to which they engage in intracorporate transactions and whether they are receivers or providers of what is being transacted. Gupta and Govindarajan (2000) further maintain that MNCs exist primarily because of their superior ability to transfer knowledge internally, relative to the ability of markets. In this article we focus on conditions that facilitate intracorporate knowledge flows among subsidiaries.

In a strategic alliance, knowledge transfer can be viewed from several perspectives. First, firms may acquire knowledge useful in the design and management of other alliances (Lyles, 1998). This collaborative know-how may be applied to the management of future alliances. Second, firms may acquire knowledge about an alliance partner that supports the firm's ability to manage the collaborative task. The knowledge obtained can be central to the evolution of the alliance (Ariño & de la Torre, 1998; Doz, 1996). Third, firms learn with an alliance partner when the partners jointly enter a new business area and develop new capabilities. Last, firms acquire knowledge from an alliance partner by gaining access to the skills and competencies the partner brings to the alliance (Baum et al., 2000; Kogut, 1988). In this context, alliances provide opportunities to create redeployable knowledge (or private benefits), such as technical knowledge or market knowledge. For the purpose of our discussion, we focus on the last
two perspectives, which concern knowledge flows between alliance partners.³

A large number of recent studies of industrial districts have emphasized the capacity of districts to support processes of knowledge acquisition and innovation as the basis for creating competitive advantage (for a review, see Mackinnon, Cumbers, & Chapman, 2002). Firms in an industrial district have various opportunities to tap into a larger knowledge resource base. The knowledge of primary interest is usually highly tacit, difficult to replicate, and not easily purchased. Helmsing, citing Lawson (1999), describes industrial district learning as the "emergence of basic shared knowledge and procedures amongst a group of (geographically close) firms which facilitates co-operation and problem-solving" (2001: 289). Geographic proximity facilitates knowledge flows and technical exchanges among firms (Marshall, 1920).

Keeble and Wilkinson (1999) identify three major mechanisms for the spatial transfer of knowledge within the boundaries of an industrial district: (1) interfirm mobility of the labor force within the district; (2) interactions between suppliers and customers and the makers and users of capital equipment; and (3) spin-off of new firms from existing firms, universities, and public sector research laboratories. The knowledge transfer processes taking place in an industrial district give rise to cumulative local know-how that goes beyond the boundaries of the firm but that remains within the spatial boundaries of the district (Capello, 1999).

SOCIAL CAPITAL

Those studying interfirm relationships increasingly focus on how firms are socially embedded in networks of relationships that incorporate a diverse set of organizational actors. Social capital is gaining prominence as a concept that provides a foundation for describing and characterizing a firm’s set of relationships. However, although the concept of social capital has found widespread acceptance, there remains widespread uncertainty about its meaning and effects (Koka & Prescott, 2002).

In his review, Portes (1998) identifies Pierre Bourdieu’s (1986) analysis as the first systematic analysis of social capital. Bourdieu defined the concept as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (1986: 248). As the concept evolved, through work by Coleman (1988), Burt (1992), and others, a consensus emerged that social capital represents the ability of actors to secure benefits by virtue of membership in social networks or other social structures (Portes, 1998). At an organizational level, benefits include privileged access to knowledge and information, preferential opportunities for new business, reputation, influence, and enhanced understanding of network norms.

Although Adler and Kwon’s (2002) comprehensive review identifies many different approaches used in studying social capital, two patterns emerge from the various definitions (Leana & Van Buren, 1999). The first is derived from social network theorists (e.g., Belliveau, O’Reilly, & Wade, 1996; Burt, 1997; Useem & Karabel, 1986), who emphasize personal benefits, such as career advancement, that actors gain directly from their social capital. Proponents of this perspective consider social capital a private good possessed by individuals. Other scholars conceptualize social capital as a public good (e.g., Bourdieu, 1986; Coleman, 1988; Putnam, 1993). They regard social capital as an attribute of a social unit, rather than an individual. As a public good, social capital is available to and benefits not only those who create it but also group members at large (Kostova & Roth, 2003).

For this paper we adopt a definition of social capital similar to that offered by Nahapiet and Ghoshal (1998) and used by Bolino, Turnley, and Bloodgood (2002).⁴ We define social capital as

³ We do not assume the existence of a dominant partner in the strategic alliance. Power dynamics in a strategic alliance are complicated and beyond the scope of this paper. For instance, a joint venture partner with minority equity can use various ways to control the venture (Hamel, 1991; Schoan, 1988). Moreover, bargaining power may shift from one partner to another, depending on their relative learning speeds (Inkpen & Beamish, 1997). As can be seen from our discussions, virtually all of our arguments apply to alliances with or without dominant partners.

⁴ In their footnote 1 Bolino et al. (2002) acknowledge that alternative social capital frameworks exist. Their rationale for using Nahapiet and Ghoshal’s (1998) framework is fourfold: (1) it integrates many of the social capital facets discussed in previous work, (2) it is useful for examining social
the aggregate of resources embedded within, available through, and derived from the network of relationships possessed by an individual or organization—a definition that accommodates both the private and public good perspectives of social capital. The central proposition in this view of social capital is that networks of relationships are a valuable resource (i.e., capital) for the individual or organization. The logic of this view can be seen in the example of a firm that establishes a network tie with another firm, such as a supply contract. This network tie becomes a social capital resource of the two firms. As time passes, trust between the firms may develop, and such trust, in addition to the formal tie between the firms, will also constitute a social capital resource. The social capital of the firms is thus enhanced. From the social capital, various benefits, such as preferential knowledge access, may flow to the firms.

Individual social capital originating from an individual’s network of relationships can be distinguished from organizational social capital derived from an organization's network of relationships.\(^5\) The former has the property of a private good, whereas the latter takes on the nature of a public good. With social capital as a public good, members of an organization can tap into the resources derived from the organization’s network of relationships without necessarily having participated in the development of those relationships (Kostova & Roth, 2003). These two levels of social capital are often interrelated. For example, a manager, through his or her own social relationships and personal connections, can help his or her company set up a joint venture with another company. In this case, organizational social capital is created on the basis of individual social capital.

For a systematic analysis of organizational social capital across multiple network types, we need to distinguish among (1) the possessors of social capital, (2) the dimensions of social capital, (3) the benefits of social capital, and (4) the factors that operate as determinants of social capital benefits. In this article the possessors of organizational social capital are the members of the three network types identified above. The social capital benefit examined is the opportunity to acquire knowledge from other network members. As discussed in the following section, the dimensions of social capital refer to the clusters of the main facets of social capital (Nahapiet & Ghoshal, 1998). After the discussion of these dimensions, our attention shifts to the determinants of knowledge transfer, which is the social capital benefit examined in this paper. We propose conditions that facilitate knowledge transfer. Our fundamental argument is that, depending on the network type, different conditions will affect how the social capital dimensions influence knowledge transfer. This section links the social capital dimensions with network types and provides a set of theoretical relationships. Although we focus on analyzing organizational social capital across network types, we also incorporate individual social capital in our discussion, because the interplay between the two affects knowledge transfer between network members.

**DIMENSIONS OF SOCIAL CAPITAL AND NETWORK TYPES**

Knowledge acquisition has been identified as a direct benefit of social capital (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998). In this paper we seek to understand how knowledge moves within networks and how social capital affects the knowledge movement. To achieve this objective, we adopt Nahapiet and Ghoshal’s (1998) three dimensions of social capital: structural, cognitive, and relational.

Table 1 shows the three network types and the three social capital dimensions. We draw from the literature to illustrate how these social capital dimensions are embedded in each network type. Depending on the network type, the nature of social capital varies. We note that within each network type there is substantial variance, in that there are different forms of intracorporate networks, strategic alliances, and so on. The characteristics of social capital in Table 1 are associated with the more typical forms of each network type.

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\(^5\) Our conceptualization of organizational social capital is different from that of Leana and Van Buren, who define it as “a resource reflecting the character of social relations within the firm” (1999: 538).
<table>
<thead>
<tr>
<th>Social Capital Dimensions</th>
<th>Intracorporate Network</th>
<th>Strategic Alliance</th>
<th>Industrial District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network ties</td>
<td>Fuzzy distinction between intramember and intermember ties</td>
<td>Intermember ties determining social ties within an alliance</td>
<td>Social ties as a foundation for intermember ties</td>
</tr>
<tr>
<td>Network configuration</td>
<td>Hierarchical, easy to establish connectivity between network members</td>
<td>Nonhierarchical, possibility of exploiting structural hole positions</td>
<td>Nonhierarchical and dense networks in a geographical region</td>
</tr>
<tr>
<td>Network stability</td>
<td>Stable membership</td>
<td>High rate of instability</td>
<td>Dynamic, with members joining and leaving the district</td>
</tr>
<tr>
<td>Cognitive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared goals</td>
<td>Members working toward a common goal set by headquarters</td>
<td>Compatible goals but rarely common goals</td>
<td>Neither shared nor compatible goals</td>
</tr>
<tr>
<td>Shared culture</td>
<td>Overarching corporate culture</td>
<td>Cultural compromise/conflict among members</td>
<td>Industry recipe</td>
</tr>
<tr>
<td>Relational: Trust</td>
<td>Little risk of opportunism, institutional-based trust</td>
<td>Significant risk of opportunism, behavioral-based trust</td>
<td>Process-based personal trust</td>
</tr>
</tbody>
</table>

### Structural Dimension

The structural dimension of social capital involves the pattern of relationships between the network actors and can be analyzed from the perspective of network ties, network configuration, and network stability.6 Network ties deal with the specific ways the actors are related. Ties are a fundamental aspect of social capital, because an actor’s network of social ties creates opportunities for social capital transactions (Adler & Kwon, 2002). A key feature of intracorporate networks is that members of a network belong to the same corporation. As such, ties within a member, such as interdepartmental and interpersonal relationships, may not be very different in nature from those between members. In other words, boundaries of network members are more porous than those of other network types. The nature of ties between alliance partners will impact the social ties between managers who are assigned to the alliance by the partners. For instance, in an alliance formed between keen competitors, such social ties will likely be cautious and tense, because each partner is wary of divulging valuable knowledge to other partners. That is, the nature of organizational social capital sets the tone for individual social capital. An important characteristic of network ties between members in an industrial district is that, more often than not, they are established as a result of interpersonal relationships developed from informal social gatherings and meetings (Brown & Hendry, 1998; Paniccia, 1998). As such, individual social capital forms the basis of organizational social capital.

The configuration of a network structure determines the pattern of linkages among network members. Such elements of configuration as hierarchy, density, and connectivity affect the flexibility and ease of knowledge exchange through their impact on the extent of contact and accessibility among network members (Krackhardt, 1992). Intracorporate networks are often

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6 The facets of each social capital dimension discussed in this paper are by no means exhaustive. Owing to space limitations, we focus on facets that are most related to knowledge transfer between network members. For instance, we replace the facet “appropriable organization,” which Nahapiet and Ghoshal (1998) include in their structural dimension, with “network stability.” Our rationale is that stability varies greatly across network types and has serious implications for knowledge transfer. These points are explained in detail in the following discussion.
arranged in a hierarchical way, with headquarters being at the top of the hierarchy. Depending on the overall corporate structure, some members of the network may not be connected to other members. Connectivity can be easily established either through the headquarters or on the members’ own initiatives. Although alliances such as equity joint ventures are broader and deeper in interactions than alliances such as technology licenses, the structure of a strategic alliance is nonhierarchical. Connectivity is less straightforward than the case of intracorporate networks, since it needs to be established across firm boundaries. Thus, some members may span the structural holes of the network and enjoy the associated informational advantages (Burt, 1992). Connectivity between network members in an industrial district is usually established through informal interpersonal relations. While a general pattern, in terms of network density, for intracorporate networks and alliances would be unusual, a characteristic of an industrial district is dense, nonhierarchical networks of firms located within the district, with some of them forming cliques.

Network stability is defined as change of membership in a network. A highly unstable network may limit opportunities for the creation of social capital, because when an actor leaves the network, ties disappear. While stability is not a major issue in intracorporate networks unless there are frequent corporate restructuring activities, it is a much studied concept in the alliance area, perhaps because of the high instability rate usually attributed to this particular network form (Inkpen & Beamish, 1997; Yan & Zeng, 1999). Last, membership in an industrial district is often unstable, with firms joining and leaving the district continuously.

Cognitive Dimension

The cognitive dimension represents the resources providing shared meaning and understanding between the network members (Nahapiet & Ghoshal, 1998). The two facets of the dimension we address are shared goals and shared culture among network members. Shared goals represent the degree to which network members share a common understanding and approach to the achievement of network tasks and outcomes. Depending on the network type, the tasks and outcomes may vary in clarity and definition. Members of an intracorporate network usually work toward a common goal set by headquarters, although they may have to fulfill certain secondary goals related to their own products and markets. Partner firms often have different goals in mind when they enter a strategic alliance. Negotiation helps partners arrive at goals that are acceptable to most, if not all, of them. In an industrial district there are likely to be few shared or even compatible goals, owing to the complexity of the network ties.

Shared culture refers to the degree to which norms of behavior govern relationships. This facet is similar to tie modality, which is “the set of institutionalized rules and norms that govern appropriate behavior in the network. While these are sometimes spelled out in formal contracts, most often they are simply understandings that evolve within the dyad and the network” (Gulati et al., 2000: 205). In some cases shared norms may create excessive expectations of obligatory behavior and may possibly result in problems of free riding and unwillingness to experiment beyond the network. Members of an intracorporate network work under an overarching corporate culture. For instance, all the operations of Johnson & Johnson worldwide subscribe to the strong ethical culture set by the headquarters. Since partner firms usually have distinct cultures, strategic alliances are often formed on the basis of cultural compromise among the partners concerned. Cultural conflict will arise if certain partners rigidly push forward their own ways of doing things. Although firms in an industrial district may have various distinct cultures, they tend to share an industry recipe. As organizational ecologists (e.g., Hannan & Freeman, 1977) argue, firms in the same line of business experience substantial pressure to adopt similar policies. Similarly, Spender’s (1989) study indicates that, in the face of uncertainty, managerial recipes specific to task environments gradually evolve and are adopted by firms operating in the industries concerned.

Relational Dimension

The relational dimension focuses on the role of direct ties between actors and the relational, as opposed to structural, outcomes of interactions. Among the facets of this dimension, such as trust, norms, and identification, we focus on
trust, both because of space limitations and because trust is a critical factor affecting interfirm knowledge transfer and creation (Dodgson, 1993; Doz, 1996). Trust is based on social judgments (e.g., assessment of the other party’s benevolence, competence, etc.), together with assessment of the costs (i.e., risk) if the other party turns out to be untrustworthy (Rousseau, Sitkin, Burt, & Camerer, 1998). Under a risky condition, a party’s trust is signified by a decision to take action that puts its fate in the hands of the other party.

Trust plays a key role in the willingness of network actors to share knowledge. A lack of trust may lead to competitive confusion about whether or not a network firm is an ally (Powell, Koput, & Smith-Doerr, 1996). Conversely, an atmosphere of trust should contribute to the free exchange of knowledge between committed exchange partners, because decision makers should not feel that they have to protect themselves from others’ opportunistic behavior (Blau, 1964; Jarillo, 1988). As trust develops over time, opportunities for knowledge transfer between network members should increase. With the development of a pattern of interactions, organizations will decrease their efforts to protect their knowledge and skills.

Trust in an intracorporate network is institutional based: the fact that an organization is a member of the network signifies to other members that the former should be trustworthy. While risk of opportunism is normally not a concern for intracorporate networks, it is a serious concern for strategic alliances. Unlike intracorporate networks, trust in strategic alliances is behavioral based. A partner firm needs to signify its trustworthiness through the way it behaves in the alliance. For industrial districts, interpersonal trust plays a critical role, since, as mentioned earlier, individual social capital drives the development of organizational social capital. Moreover, trust is process based, in the sense that firms regularly test each other’s integrity, moving from small, discrete exchanges of limited risk to more open-ended deals that subject the parties to substantial risk (Lazerson & Lorenzoni, 1999).

Through the various ties that firms have with other firms, network members are exposed to various types of knowledge that are potentially valuable. As Powell states, “The most useful information is rarely that which flows down the formal chain of command in an organization, or that which can be inferred from price signals. Rather, it is that which is obtained from someone you have dealt with in the past and found to be reliable” (1990: 304).

From a network perspective, Podolny and Page (1998) identify two types of learning. First, networks can facilitate learning via the transfer of knowledge from one firm to another. In other words, the network acts as a conduit for processing and moving knowledge; learning from an alliance partner is this type of learning. Second, networks may become the locus of novel knowledge creation at the network level, rather than within the nodes—firms—of the network. Although our focus is primarily on the network as a conduit for knowledge transfer, the two forms of network learning are not always easy to distinguish in practice.

The dependent variable in this discussion is knowledge transfer between network members. Based on the key argument that social capital plays a critical role in the transfer and exchange of network knowledge, we propose a set of conditions that facilitate knowledge transfer in networks. These facilitating conditions, as summarized in Table 2, are factors specifically associated with the respective facets of the three social capital dimensions. Our objective in this section is to identify specific relationships between social capital and knowledge transfer. Because the facilitating conditions that influence knowledge transfer differ across network types, we show that developing an understanding of social capital and networks requires an analysis of the specific features of the different network types.

NETWORKS AND KNOWLEDGE TRANSFER

In this section we examine social capital determinants of network knowledge transfer.

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7 In integrating various bodies of literature, we were confronted with differences in how such terms as knowledge transfer and learning have been used. The social capital literature usually discusses knowledge transfer (and access) rather than learning. The network literature, however, as the Podolny and Page (1998) reference indicates, uses the term learning in reference to the knowledge acquisition process. We have tried to be as consistent as possible in the use of terminology.
TABLE 2
Conditions Facilitating Knowledge Transfer

<table>
<thead>
<tr>
<th>Social Capital Dimensions</th>
<th>Intracorporate Network</th>
<th>Strategic Alliance</th>
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<tbody>
<tr>
<td>Structural</td>
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<tr>
<td>Network ties</td>
<td>Personnel transfer</td>
<td>Strong ties through repeated exchanges</td>
<td>Proximity to other members</td>
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<td>between network</td>
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<td></td>
<td>members</td>
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<tr>
<td>Network configuration</td>
<td>Decentralization of</td>
<td>Multiple knowledge connections between partners</td>
<td>Weak ties and boundary spanners to maintain relationships with various cliques</td>
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<tr>
<td></td>
<td>authority by</td>
<td></td>
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<tr>
<td></td>
<td>headquarters</td>
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<tr>
<td>Network stability</td>
<td>Low personnel turnover</td>
<td>Noncompetitive approach to knowledge transfer</td>
<td>Stable personal relationships</td>
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<td></td>
<td>organization wide</td>
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<tr>
<td>Cognitive</td>
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<tr>
<td>Shared goals</td>
<td>Shared vision and</td>
<td>Goal clarity</td>
<td>Interaction logic derived from cooperation</td>
</tr>
<tr>
<td></td>
<td>collective goals</td>
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<td></td>
</tr>
<tr>
<td>Shared culture</td>
<td>Accommodation for local or national cultures</td>
<td>Cultural diversity</td>
<td>Norms and rules to govern informal knowledge trading</td>
</tr>
<tr>
<td>Relational: Trust</td>
<td>Clear and transparent</td>
<td>Shadow of the future</td>
<td>Commercial transactions embedded in social ties</td>
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<td></td>
<td>reward criteria to</td>
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<td></td>
<td>reduce mistrust among</td>
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<tr>
<td></td>
<td>network members</td>
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</table>

The focus in Table 2 is on organizations within the network, rather than the network itself. We discuss knowledge acquired by network members through participation in the network’s knowledge-sharing activities. The hypothesized conditions, elaborated in the following section, can be readily converted into testable propositions and provide suggested directions for future research.

Before getting to the detailed discussion, we illustrate the logic of the table. One of the structural facets is network configuration. At a broad level, network configuration affects the flexibility and ease of knowledge exchange between network members. For example, for intracorporate networks, a facilitating condition (for network configuration) is headquarter’s decentralization of authority to network members such that the development of lateral network ties and knowledge transfer is enhanced. Expressed as a proposition, the greater headquarter’s decentralization of authority to intracorporate network members, the more likely ties between the members will develop that lead to knowledge transfer. As another example, having boundary spanners maintain weak ties with various cliques for exploration purposes is an important facilitating condition for firms operating in an industrial district. Expressed as a proposition, the greater the presence of boundary spanners with weak ties to various cliques, the more likely a pattern of linkages among network members will develop that lead to knowledge transfer.

Structural Dimension

Network ties. Since the boundaries between intracorporate network members are more porous than those between members of other network types, personnel transfer between members should take place more readily. Such transfers establish social network ties on top of the more formal intermember ties; the latter, in turn, are strengthened by the existence of the former. The social network ties facilitate intermember social interactions and provide channels for knowledge exchange. Ghoshal, Korine, and Szulanski’s (1994) research on MNCs documents the importance of such social interactions for diffusing new ideas within the corporations. In an in-depth case study of a Dutch multinational software company, Orlikowski (2002) found that expatriates brought with them skills and techniques to share with local engineers.

For knowledge transfer to occur in alliances, strong ties between the partners are necessary (Inkpen & Dinur, 1998). Factors supporting the development of strong ties include prior partner
relationships and repeated transactions (Gulati, 1995). In the absence of strong ties, especially in alliances between competitors, partners may not develop the necessary relationships that allow managers to share knowledge willingly. Larson (1992) has shown that strong ties promote and enhance trust, reciprocity, and long-term perspectives. Kale, Singh, and Perlmutter (2000) found a positive relationship between the strength of ties and the degree of learning in alliances.

For industrial districts, Camagni (1995) identifies spatial proximity as a key characteristic of what he calls "a local network." From the perspective of an individual firm, it is beneficial to be located physically close to other firms in the district. Proximity helps the formation of network ties and facilitates interfirm and especially interpersonal interactions through which knowledge is exchanged. The more tacit the knowledge involved, the more important spatial proximity is between the parties taking part in the exchange (Maskell & Malmberg, 1999). This implies that firms occupying more central locations of the district have the edge over those located at the periphery.

**Network configuration.** As argued by Grant, "Once firms are viewed as institutions for integrating knowledge, a major part of which is tacit and can be exercised only by those who possess it, then hierarchical coordination fails" (1996: 118). Thus, the headquarters of an intracorporate network must decentralize authority to members of the network so that they can determine how to make the best use of the knowledge they possess. Moreover, decentralization enables members to establish lateral ties on their own initiative, without first seeking approval from headquarters. Decentralization can facilitate timely knowledge sharing among the members. Tsai's (2002) study of a large, multiunit company confirms that centralization is negatively associated with intracorporate knowledge sharing.

Based on the notion of connections through which alliance managers can share their observations and experiences (Von Krogh, Roos, & Slocum, 1994), Inkpen and Dinur (1998) identify four types of alliance structural ties that can lead to knowledge sharing: technology linkages, alliance-parent interaction, personnel transfers, and strategic integration. The four processes share a conceptual underpinning in that each creates the potential for individuals to share their observations and experiences. Each of the four processes provides an avenue for managers to gain exposure to knowledge and ideas outside their traditional organizational boundaries, and each creates a connection for individual managers to communicate their alliance experiences to others.

In industrial districts, cliques of firms with strong ties may be formed. For instance, in the City of London, Japanese banks may form one clique and American banks another. While there are intense knowledge exchanges within a clique, there may be little between cliques. From the perspective of an individual firm operating in the district, it is crucial to have boundary spanners who maintain weak network ties with various cliques for exploration purposes (Rowley, Behrens, & Krackhardt, 2000). One simple way to achieve this is through participating in the activities of professional associations. In the case of the City of London, one such association is the Chartered Institute of Bankers, which is a British association of banking professionals.

**Network stability.** Although the membership of an intracorporate network is usually more stable than that of other network types, this stability may not help knowledge transfer if there is a high personnel turnover rate. Organizational learning depends, at least partially, on memories of individuals and their learning abilities (Carley, 1992). Individuals leaving a network take with them knowledge that may be crucial for organizational success. In addition, personnel turnover affects intracorporate knowledge sharing, which often takes place through formal or informal exchanges on an individual basis. Such exchanges are facilitated by established rapport and friendship. Maintaining a stable pool of personnel within a network can help individuals develop long-lasting interpersonal relationships.

Learning from an alliance partner is a key determinant of bargaining power and alliance stability (Hamel, 1991; Inkpen & Beamish, 1997; Yan, 1998). Hamel (1991) proposes that the most important determinant of partner bargaining power in alliances is the ability to learn. Firms that can learn quickly are able to acquire partner skills, reducing their dependence and increasing their bargaining power. Inkpen and Beamish (1997) used these arguments to develop a framework of instability and international
joint ventures. In an alliance, dependence can be a source of power for the firm controlling the key resources. When knowledge acquisition shifts the dependency relationship, the cooperative basis for the alliance may erode, leading to instability. If one partner acquires knowledge faster than the other, the faster-learning partner no longer has the same need, which can lead to a situation of partner asymmetry (Makhija & Ganesh, 1997). Thus, if partner firms regard their alliance as a learning race field, the partner learning faster will be motivated to leave the alliance. If the attitude toward learning is non-competitive, however, destabilizing forces will be less likely and greater symmetric learning may occur.

Industrial districts are characterized by the constant entry and exit of firms. From the perspective of firms remaining in the district, outgoing firms take with them not only knowledge but also important personal contacts (unless the employees concerned choose to stay behind). Boundary spanners of the firms that remain may try to establish more intimate and stable personal relationships with their counterparts in the exiting firms. In this way, personal contacts can be maintained and may continue to serve as useful sources of industrial information for firms that continue to stay in the district. In other words, these firms' networks extend beyond the district. Such external contacts are important channels for obtaining fresh ideas, especially when managers within the district become more homogeneous in their mental models over time (Pouder & St. John, 1996).

Cognitive Dimension

**Shared goals.** We follow Tsai and Ghoshal (1998) in using the term *shared vision*, which embodies the collective goals and aspirations of the members of an intracorporate network. When a shared vision is present in the network, members have similar perceptions as to how they should interact with one another. This can promote mutual understandings and exchanges of ideas and resources. Thus, a shared vision can be viewed as a bonding mechanism that helps different parts of a network integrate knowledge.

When partner firms bring contradicting or inconsistent goals into their strategic alliance, interpartner conflict may arise. Conflict among parties in an interfirm collaboration tends to result in frustration and dissatisfaction (Anderson, 1990). Such a negative atmosphere is not conducive to the flow of knowledge between the partners and the alliance. In studying intra- and interdepartmental conflict within a large utility company, Schnake and Cochran (1985) found that lower levels of goal clarity increased both types of conflict. For strategic alliances, we also expect that goal clarity reduces interpartner conflict by facilitating the negotiation and establishment of common goals. When the objectives and strategies of an alliance are clearly stated, a foundation of common understanding and the means to achieve the collaborative purpose is established among the partners (Das & Teng, 1998).

For firms in an industrial district to willingly share knowledge, they must recognize that cooperation and knowledge sharing can enhance their competitive position. In addition, firms must recognize that combining the economic, cultural, and technological resources of the industrial district can lead to joint knowledge creation. Thus, firms will share knowledge when an interaction logic is shared across network members (Helmsing, 2001). This logic is derived from the belief that value can be created through cooperation and knowledge sharing. Joint problem-solving arrangements enrich the network, because working through problems promotes innovation (Uzzi, 1997).

**Shared culture.** Although the headquarters of an intracorporate network may try to impose its corporate culture in all worldwide operations, each operation is geographically embedded in local or national culture (Ghoshal & Bartlett, 1990). For instance, a corporate culture emphasizing participative decision making may not work well in a high power distance culture. The local or national culture needs to be understood and accommodated so that when knowledge is transferred from one member to another, the transfer process will not be hindered by cultural conflicts between concerned members (see Bhagat, Kedia, Harveston, & Triandis, 2002).

Arguments for and against partner cultural diversity as an antecedent for alliance learning have been made. Although Parkhe (1991) has proposed that diversity between the partners in international strategic alliances could lead to learning, Pitts and Lei (1997) have argued that alliances designed to learn and absorb tacit
knowledge are harder to manage among partners that come from different cultural contexts than partners from a similar cultural context. Phan and Peridis (2000) have proposed that differences between partners support the learning process. The authors' rationale is that attempts to eliminate differences can block second-order learning processes. We maintain that the overall effect of cultural diversity should be beneficial to knowledge transfer.

A major barrier to informal exchange of knowledge in an industrial district is the risk that the receiver of such knowledge may use it against the interest of the sender. This risk can be reduced and, hence, the exchange facilitated if there are implicit industrial norms and rules in the district governing informal know-how trading among firms such that opportunism is subject to severe social sanctions. The norms and rules include a common language for talking about organization and cultural problems and accepted but tacit codes of conduct between firms (Helmsing, 2001). In an interesting study of the extensive exchange of proprietary know-how by informal networks of process engineers in the U.S. steel minimill industry, Von Hippel (1987) found such norms.

Relational Dimension: Trust

An intracorporate network is a social structure of coopetition (Tsai, 2002). While intermember cooperation is encouraged so as to realize economies of scale, intermember competition can also achieve efficiency (Hill, Hitt, & Hoskisson, 1992). When members compete against one another for resources and markets, suspicion may replace trust in their relationship and, consequently, knowledge sharing may be sacrificed.8 It is important that headquarters establish clear and transparent reward criteria so that the members concerned will not suspect any under-the-table transactions or favoritism. Clear and transparent reward criteria will reduce mistrust among the members.

Parkhe's (1993) study of strategic alliance structuring suggests that opportunism is constrained and cooperation promoted by the shadow of the future, which can be lengthened by long time horizons, frequent partner interactions, and high behavioral transparency. As the fear of opportunism by alliance partners fades because of the development of mutual trust, partners will be more willing to move forward, even though uncertainty in the relationship may remain (Nooteboom, Berger, & Noorderhaven, 1997). When trust is high, firms may be more likely to invest resources in learning because of the willingness of their partners to refrain from instituting specific controls over knowledge spillovers.

In an industrial district, many of the exchanges between network members are commercial transactions. Uzzi and Gillespie (2002) argue that, in contrast to purely market-based transactions, commercial transactions embedded in social ties instill into future exchanges expectations of trust and reciprocity. In turn, relationships based on trust and reciprocity are likely to promote the transfer of distinctive knowledge and resources. When the relationships between industrial network members are embedded with trust, firms may be more willing to share valuable knowledge and accept the risk of spillover to competitors (Dyer & Singh, 1998).

Interplay Between Individual and Organizational Social Capital

We noted earlier that social capital can be created at individual and organizational levels.9 For interorganizational knowledge transfer to take place in a network, either or both levels of social capital must be present. The discussion based on Table 1 indicates that the three network types display different characteristics with respect to the two levels of social capital. For example, for the network ties facet, interpersonal relationships developed from informal social gatherings and meetings are an important characteristic of ties between members in an

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8 We do not expect that the suspicion will lead to rampant opportunism, because the penalties imposed on managers who are caught acting opportunistically may be severe. In contrast, in strategic alliances, if opportunism is punished, the punishment will usually be at the organizational rather than individual level. Managers who act opportunistically in the alliance are normally under the direction of the partner employing them.

9 In recent years organizational researchers have increasingly tried to examine multilevel theoretical perspectives for concepts such as creativity (Drazin, 1999), learning (Kim, 1993), and trust (Inkpen & Currall, 2002).
industrial district. In contrast, for alliances, the nature of organizational-level ties has a significant impact on interpersonal ties. Based on the mix of individual and organizational characteristics, the facilitating conditions summarized in Table 2 can be examined more closely.

Compared with strategic alliances and industrial districts, in intracorporate networks organizational social capital is readily available between members. Intracorporate network members are connected within a corporate organizational structure that is relatively stable (compared to an alliance network or industrial district). Also, relative to the other network forms, intracorporate network members are more likely to work toward a common corporate goal, share an overarching corporate culture, and trust one another. As a result, some knowledge access and transfer will occur by default. By default, we mean that, by virtue of being part of the network, subsidiary units are entitled to obtain certain organizational knowledge from the headquarters or other subsidiaries.

While there may be personal reasons for intracorporate managers not to share knowledge, there will not be the same type of competitive and firm-level barriers to knowledge sharing that exist in alliance networks and industrial districts. However, establishing individual social capital will strengthen the knowledge flow. For instance, suppose an engineer of a subsidiary is sent to headquarters to learn a new technology. The public good nature of the organizational social capital between the subsidiary and headquarters enables the engineer to access the new technology. Nevertheless, the development of positive interpersonal relationships between the engineer and those teaching the technology should allow for a faster and broader dissemination of knowledge. Thus, some of the facilitating conditions in Table 2 are concerned with developing individual social capital. For instance, personnel transfer and low managerial turnover can help individuals establish close, long-lasting social ties that expedite knowledge transfer between network members.

Unlike an intracorporate network, a strategic alliance is an interfirm relationship with legal and organizational boundaries between firms. Also unlike an intracorporate network, the existence of an alliance does not guarantee a flow of knowledge between partners, who often have a competitive-collaborative relationship (see Hamel, 1991). Knowledge may flow very slowly or not at all.10

Properly managing this relationship is critical if the partners seek access to each other's knowledge. As discussed earlier, the nature of organizational social capital often sets the tone for individual social capital in an alliance setting. Hence, organizational social capital will likely be the dominant form of social capital necessary for knowledge to flow between alliance partners. For example, it is not uncommon for managers who are assigned to alliances to make comments such as "Joe, my counterpart from the alliance partner, is my good friend and I trust him. However, there are things we cannot share without our parents' authorization." Looking at Table 2 shows that the facilitating conditions focus on building up organizational social capital between alliance partners.

In an industrial district, knowledge flows start on a personal level, because there may not be formal interfirm relationships. When there are formal relationships, they will tend to be commercial transactions, as opposed to the more structured nature of an alliance relationship. Thus, individual social capital is critical, drives the development of organizational social capital, and becomes the focus of the facilitating conditions in Table 2.

In summary, the three network types involve different dynamics between organizational and individual social capital. Such dynamics have important implications for knowledge transfer between network members and impact the proposed facilitating conditions. Organizational social capital, for example, takes priority over individual social capital in strategic alliances, whereas the reverse is true in industrial dis-

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10 The existence of an intracorporate network means that some organizational social capital will exist (by default) and some knowledge will flow between the members. When an alliance is formed, there is at least some social capital, because a network tie has been formed. However, the basic structural tie between the partners (in the form of an alliance agreement) in the absence of additional social capital means that a large-quantity knowledge flow is unlikely. An interesting and challenging empirical question involves the minimum level of organizational and individual social capital necessary to effect knowledge transfer. Even more complicated is the comparative question, "How much social capital is necessary to effect knowledge transfer in an intracorporate network versus an alliance network versus an industrial district?"
tricts. For intracorporate networks, we have suggested that social capital that impacts knowledge transfer will begin at an organizational level and then be enhanced by social capital developments at the individual level.

Network Boundary Conditions

Our analysis helps identify boundary conditions associated with each network type, with respect to intermember knowledge transfer. For example, in his study of knowledge sharing within an intracorporate network, Tsai (2002) maintains that social interaction among organizational units facilitates intraorganizational knowledge sharing. He argues further that "knowledge sharing among competing units within the same organization carries synergistic benefits because these units deal with similar resource constraints and market situations" (2002: 182). Therefore, Tsai proposes that social interaction is more positively associated with knowledge sharing among units that compete with each other than among units that do not (i.e., his Hypothesis 4).

Tsai's argument is valid in the case of intracorporate networks, where organizational social capital is readily available between network members and the development of individual social capital will help knowledge transfer or sharing. Although network members may compete with each other, the risk of knowledge leakage from one unit to another is not a major concern, because these units work under the same corporate roof.

However, the situation will be different in alliance networks. When alliance partners are keen competitors, interpartner learning may become a race (Hamel, 1991). Partners avoid inadvertently transferring knowledge beyond what is stated in the alliance agreement. Managers who are appointed to the alliance will be well aware of this risk and more cautious in their social interaction. Hence, we expect exactly the opposite of Tsai's hypothesis to happen—that is, social interaction will be more positively associated with knowledge sharing among alliance partners that do not compete with each other than among partners that do. In fact, when alliance partners are keen competitors and managers strictly follow the rules set by their respective parent companies, social interaction may not have any impact on knowledge sharing.

DISCUSSION

In examining various social capital dimensions, we address an issue raised by Uzzi and Gillespie (2002): structural approaches to networks that ignore social qualities inadequately specify how networks function. We also address Kostova and Roth's (2003) call for more research on the outcomes of social capital. This paper shows that each network type has distinct social capital dimensions. By linking these dimensions to knowledge transfer in networks, a social capital outcome, we show that the facilitating conditions vary across networks. For effective and efficient knowledge transfer to occur, firms may have to manage and build social capital proactively. The conditions identified can be viewed as predictive conditions and provide guidance for firms seeking to exploit network knowledge opportunities.

Implications for Future Research

An examination of the conditions facilitating learning and knowledge transfer (Table 2) reveals some implications for future research. First and obviously, the sheer number of relationships illustrates the complexity of this area. The introduction of social capital variables into the analysis of networks and knowledge transfer adds a level of complexity that has not yet been examined empirically.

Second, virtually all the existing theoretical and empirical studies of interorganizational knowledge transfer are based on a single network type, without any reference to the boundary conditions. The question of how far the results of these studies can be generalized from one network type to another rarely has been examined. The distinct facilitating conditions across network types listed in Table 2, and the preceding discussion of social capital levels, suggest that generalizability across network types may be limited and that a contingency approach is appropriate. In other words, processes of interorganizational knowledge transfer are affected by the nature of the network type in which the organizations are embedded.

Third, although facilitating conditions are distinct across network types, there is value to be gained by integration and synthesis. The literature we examined crossed a diverse terrain, from intracorporate networks to industrial dis-
tricts. In examining the literature streams, which at present are not well integrated or linked, we realized that all networks are, at their core, about social relationships, and, therefore, social capital dimensions have applicability, regardless of the network type. In reviewing the literature on knowledge transfer in organizations, Argote and Ingram (2000) argue that social networks play an important role in knowledge transfer and yet related research is inadequate. In this article we address this deficiency and provide an agenda for future research.

Gulati et al. (2000) suggest that incorporating networks into strategic analysis leads to a more comprehensive view of the strategic behavior of firms. We agree but would argue that, to truly understand network behavior, researchers should move beyond one-size-fits-all analyses of networks. Osigweh comments that

when concepts are broadened in order to extend their range of applications, they may be so broadly defined (or, stretched) that they verge on being too all-embracing to be meaningful in the realm of empirical observation and professional practice (1989: 582).

The concept of network is one that suffers from being overstretched. As we have shown, the dynamics of knowledge transfer vary across network types. We illustrate that social capital dimensions are not uniform in their effects on knowledge transfer. Rather, they vary across different types of networks. Network theories that fail to distinguish between network types will be unable to capture the complex variety of factors associated with network knowledge processes. These theories need to develop beyond the early, broad theoretical discussions that were based on a generic type of network (e.g., Jarillo, 1988; Thorelli, 1986) and to examine in detail the characteristics of different network types.

Social capital is still in the "emerging excitement" stage of the life cycle typical of an umbrella concept and will face validity challenges in its next stage of development (Hirsch & Levin, 1999). The social capital concept has been used extensively by scholars in discussing interpersonal or interorganizational relationships of a certain type. Yet the concept seldom has been applied to compare and contrast different types of relationships. By addressing this deficiency, we have shown that the concept, in the form of both individual and organizational social capital, is useful for distinguishing between different network types and that each social capital facet gives rise to different knowledge transfer facilitating conditions across network types. Through such a compare-and-contrast analysis, we have not only clarified the meanings of the dimensions and facets of social capital but also demonstrated the value added provided by the social capital concept. Further theoretical analyses like ours will help bring the concept to the next stage of its life cycle.

In addition to the specific hypotheses suggested in Table 2, which provide substantial scope for new inquiry, several research directions can be identified. As we indicated earlier, the locus of network knowledge processes can be the network or actors, or both. Although we focused on knowledge transfer by actors that resulted from their participation in the network, there are various interesting questions involving knowledge creation by the network. For example, if the network enhances its knowledge base, how do individual actors share in the enhancement, and which social capital factors are most critical in disseminating network knowledge? In an industrial district, the network with the most fluid boundaries, how does the network knowledge base get impacted by the entry and exit of network members? In alliances, the term common benefits is synonymous with network knowledge acquisition (Khanna, Gulati, & Nohria, 1998). Are common benefits more likely to emerge under certain network configurations or conditions?

Another important research question involves the risks of social capital. Although our main thesis is that social capital has an important positive influence on knowledge transfer by network actors, it must be noted that social capital is not without risks. Uzzi (1997) argues that overembeddedness could inhibit knowledge flow into the network. For example, when firms within an industrial district establish intense network ties, they tend to pay little attention to the strategies and capabilities of competitors outside the district, resulting in a blind spot situation (Pouder & St. John, 1996). Hansen’s (2002) research on knowledge sharing in intraorganizational networks shows that a focal unit’s direct ties in a knowledge network had pros and cons. The ties provided immediate access to other business units that possessed related knowledge. However, the ties were costly to maintain. Hansen argues that direct ties are
most effective when they help units deal with difficult transfer situations, which probably involve noncodifiable knowledge. When the transfer is not difficult, the ties are likely to be harmful for unit effectiveness because of their maintenance costs. We have discussed the three dimensions of social capital independently. In future research scholars should also examine the interaction effects among these dimensions. For instance, network stability (a facet of the structural dimension) may help develop trust (a facet of the relational dimension). A facilitating condition may have effects on more than one dimension. Personnel transfer between members of an intracorporate network, for example, may contribute to establishing social network ties (a facet of the structural dimension), shared culture (a facet of the cognitive dimension), and trust (a facet of the relational dimension). Finally, although space limitations preclude a discussion of knowledge types, other research has shown that different knowledge types have different effects on organizational processes (e.g., Nonaka, 1994). For instance, for effective transfer of tacit knowledge between network members, individual social capital must be developed, because the transfer normally requires intimate personal interactions. In future research scholars may examine how social capital dimensions affect the transfer of different knowledge types.

**Limitations**

This paper is not without limitations. First, we discuss only three major network types. Other important networks and interesting social capital relationships exist. Second, our discussion of major network types is limited, in that it applies to the more typical members of each network type. There are inevitably exceptions. Third, there are other factors besides social capital factors that impact network knowledge transfer. Finally, there are multiple facilitating conditions for each facet of the social capital dimensions; we identified what we view as the most critical ones. For example, a condition we were unable to explore for industrial districts and knowledge transfer is institutional thickness in the form of an interlocking and integrated web of supportive organizations, including firms, local authorities, development agencies, financial institutions, local chambers of commerce, trade associations, and so on (Amin & Thrift, 1995). Thickness involves collective representation and common purpose (Keeble, Lawson, Moore, & Wilkinson, 1999) and helps industrial district firms develop a common vision.

**Conclusion**

We believe that network researchers must consider the potential conceptual differences across various network types. In this article we partially integrate the voluminous network and organizational knowledge literature and provide a common predictive basis for comparing knowledge transfer determinants across different types of networks. When studying network behaviors, it is thus important to first examine the nature of the network type concerned and how it differs from other types. This practice is in line with the recent call for contextualizing organizational research (Rousseau & Fried, 2001). Contextualization makes theoretical models more accurate and interpretation of empirical results more robust.

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