

Maria's collection of Social networks literature

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Adler, P. S. and S. W. Kwon (2002). "Social capital: Prospects for a New Concept." Academy of Management Review 27(1): 17-40.

A growing number of sociologists, political scientists, economists, and organizational theorists have invoked the concept of social capital in the search for answers to a broadening range of questions being confronted in their own fields. Seeking to clarify the concept and help assess its utility for organizational theory, we synthesize the theoretical research undertaken in these various disciplines and develop a common conceptual framework that identifies the sources, benefits, risks, and contingencies of social capital.

Ahuja, G. (2000). "The duality of collaboration: Inducements and opportunities in the formation of interfirm linkages." Strategic Management Journal 21(3): 317-343.

I argue that the linkage-formation propensity of firms is explained by simultaneously examining both inducement and opportunity factors. Drawing upon resource-based and social network theory literatures I identify three forms of accumulated capital-technical, commercial, and social-that can affect a firm's inducements and opportunities to form linkages. Firms possessing these capital stocks enjoy advantages in linkages formation. However, firms lacking these accumulated resources can still form linkages if they generate a radical technological breakthrough. Thus, I identify paths to linkage formation for leading as well as peripheral firms. I test these arguments with longitudinal data on technical collaborative linkages in the global chemicals industry.

Ahuja, M. K. and K. M. Carley (1999). "Network structure in virtual organizations." Organization Science 10(6): 741-757.

Virtual organizations that use e-mail to communicate and coordinate their work toward a common goal are becoming ubiquitous. However, little is known about how these organizations work. Much prior research suggests that virtual organizations, for the most part because they use information technology to communicate, will be decentralized and nonhierarchical. This paper examines the behavior of one such organization. The analysis is based on a case study of the communication structure and content of communications among members of a virtual organization during a four-month period. We empirically measure the structure of a virtual organization and find evidence of hierarchy. The findings imply that the communication structure of a virtual organization may exhibit different properties on different dimensions of structure. We also examine the relationship among task routineness, organizational structure, and performance. Results indicate that the fit between structure and task routineness affects the perception of performance, but may not affect the actual performance of the organization. Thus, this virtual organization is similar to traditional organizations in some ways and dissimilar in other ways. It was similar to traditional organizations in so far as task-structure fit predicted perceived performance. However, it was dissimilar to traditional organizations in so far as fit did not predict objective performance. To the extent that the virtual organizations may be similar to traditional organizations, existing theories can be expanded to study the structure and perceived performance of virtual organizations. New theories may need to be developed to explain objective performance in virtual organizations.

Alba, R. D. (1981). "From Small-Groups to Social Networks - Mathematical Approaches to the Study of Group-Structure." American Behavioral Scientist 24(5): 681-694.

Allcorn, S. (1997). "Parallel virtual organizations - Managing and working in the virtual workplace." Administration & Society 29(4): 412-439.

The growing presence in the workplace of computers that are linked together to form intraorganizational networks (intranets), thus enabling unprecedented electronic employee connectedness, contains within it a collision between the traditional hierarchically organized physical workplace and the potentially chaotic virtual workplace. This article describes this new workplace context as a parallel virtual organization (PVO) that possesses its own values and culture independent of its host culture, the traditional bureaucratic hierarchical organization (BHO). The growth of PVOs means that a transitional space must be developed initially between them and their BHO counterparts to enable the eventual merger of the two organization forms to create a new, more dynamic and fluid organization that, by its nature, innovates to keep pace with rapid and unrelenting change in the marketplace. The psychological, social, and technical aspects of the rise of the parallel virtual organization are discussed.

Baku, E. and M. Smith (1998). "Loan delinquency in community lending organizations: Case studies of NeighborWorks organizations." Housing Policy Debate 9(1): 151-175.

This article reports on qualitative data gathered through interviews conducted in 1996 with key leadership and staff from 13 community lending organizations. Loan servicing and collection procedures within the organizations were examined. Findings suggest that several organizational factors of nonprofit lenders are related to their loan delinquency rates: social networks, business culture, funding sources, composition of the board and loan committees, staff structure, loan intake, and collection tools. The study also finds that the nonprofit sector's institutional environment and its partnership with the private sector in a mutually beneficial process influence the loan delinquency rate. More specifically, active participation of local bankers in NeighborWorks(1) loan committees, diverse funding sources (from both the public and private sectors), and a diffusion of business practices through dense social networks are related to NeighborWorks' loan servicing and collection policy and procedures. These factors in turn influence NeighborWorks' rehabilitation loan delinquency rates.

Baldwin, T. T., M. D. Bedell, et al. (1997). "The social fabric of a team-based MBA Program: Network effects on student satisfaction and performance." Academy of Management Journal 40(6): 1369-1397.

The present study was an empirical analysis designed to measure the social networks of master of business administration (M.B.A.) students and the networks' relationships to attitudinal and performance outcomes. Results from 250 students indicated that centrality in friendship, communication, and adversarial networks affected both student attitudes and grades. Moreover, an analysis of 62 assigned teams showed that relationships within and between teams also had significant effects on student perceptions of team effectiveness and objective team performance. Implications for student networks and suggestions for future research are discussed.

Barley, S. R. (1990). "The alignment of technology and structure through roles and networks." Administrative Science Quarterly 35(1): 61-103.

A role-based approach is outlined for conceptualizing and investigating the contention in previous research that technologies change organizational and occupational structures by transforming patterns of action and interaction. Building on Nadel's (1957) theory of social structure, it is argued that the microsocial dynamics that result from new technologies reverberate up levels of analysis in an orderly manner. In particular, a technology's material attributes are said to have an immediate impact on the nonrelational elements of one or more work roles. In turn, these changes influence the role's relational elements, which eventually affect the structure of an organization's social networks. Consequently, roles and social networks are held to mediate a technology's structural effects. The theory is illustrated by ethnographic and sociometric data drawn from a comparative field study of the use of traditional and computerized imaging devices in 2 radiology departments.

Barnett, G. A. and R. E. Rice (1985). "Longitudinal Non-Euclidean Networks - Applying Galileo." Social Networks 7(4): 287-322.

Birkinshaw, J., R. Nobel, et al. (2002). "Knowledge as a contingency variable: Do the characteristics of knowledge predict organization structure?" Organization Science **13**(3): 274-289.

This paper examines the validity of knowledge as a contingency variable. Building on recent advances in thinking about the dimensions of knowledge assets (Winter 1987, Zander and Kogut 1995), we argue that such dimensions might have an important influence on organization structure. More specifically, we focus on two dimensions of knowledge—observability and system embeddedness—and their influence over the level of unit autonomy and interunit integration in an international network of R&D units. Statistical analysis of questionnaire responses from 110 R&D unit managers show strong association between the dimensions of knowledge and organization structure. It also indicates partial support for the "fit" hypothesis in contingency theory. The paper makes two important contributions to the knowledge management literature. First, we find support for the contingency logic, suggesting that effective organization design has to take into account the underlying characteristics of the firm's knowledge base. Second, we shed light on a relatively neglected dimension of knowledge that we call system embeddedness. This is the extent to which knowledge is a function of the social and physical system in which it exists. In the statistical analysis it emerges as a strong predictor of organization structure. Moreover, it also appears to be conceptually distinct from the tacit-articulate dimension that is normally emphasized. This allows us to speculate on four generic forms that a firm's knowledge might take, that we label integrated, isolated, opaque, and transparent. These are discussed using example, from the data.

Blackler, F., N. Crump, et al. (2000). "Organizing processes in complex activity networks." Organization **7**(2): 277-300.

This paper analyses practice as activity and develops a framework for analysing organizations as networks of activity systems. The approach is applied in a study of a high technology company. Key tensions in the organization are outlined and a comparative study of three strategy development teams is described. Activity theory provides the means to analyse organizations as distributed, decentred and emergent knowledge systems. It is suggested that the processes of 'perspective making', 'perspective taking' and 'perspective shaping' are central to the integration of different expert groups that need to co-operate in the pursuit of multiple, perhaps competing, objectives.

Borgatti, S. P., M. G. Everett, et al. (2002). *Ucinet for Windows: Software for Social Network Analysis*. Harvard, Analytic Technologies.

Boulay, M. and T. W. Valente (1999). "The relationship of social affiliation and interpersonal discussion to family planning knowledge, attitudes and practice." International Family Planning Perspectives **25**(3): 112-+.

Context: Past research has demonstrated an association between membership in a social club and the adoption of family planning, yet little is known about the how these groups promote the diffusion of such behavior. Methods: Data on 2,217 women aged 15-49 and 2,152 men aged 15-54 from the 1994 Kenya Situation Survey are used to examine the role of communication within individuals' social networks in mediating the association between club membership and awareness, approval and use of family planning. Results: In analyses accounting for demographic factors, women club members were 2.3 times as likely as nonmembers to know about modern methods of family planning, and male club members were 1.5 times as likely as nonmembers to know about modern contraceptives and 1.7 times as likely as nonmembers to approve of family planning. Club membership was not directly associated with increased use of contraceptives, but among both men and women, participation in a club was associated with significantly greater odds of having family planning discussions with members of both core and extended social networks. Women who had discussed family planning with both core and extended network members were 8.3 times as likely to be currently using modern contraceptives, and men who had done so were 3.2 times as likely as were those who had limited such discussions to their core network only. Conclusions: By promoting informal discussions about family planning within a group with a

diverse membership, social clubs play a mediating role in the diffusion of new information and innovative behaviors.

Brass, D. J. (1995). Creativity: It's all in your social network. Creative Actions in Organizations. C. M. Ford and D. A. Gioia. London, Sage: 94-99.

Brass, D. J., K. D. Butterfield, et al. (1998). "Relationships and unethical behavior: A social network perspective." Academy of Management Review 23(1): 14-31.

Recent models of unethical behavior have begun to examine the combination of characteristics of individuals, issues, and organizations. We extend this examination by addressing a largely ignored perspective that focuses on the relationships among actors. Drawing on social network analysis, we generate propositions concerning types of relationships (strength, multiplexity, asymmetry, and status) and the structure of relationships (structural holes, centrality, and density). We also consider the combination of the type and structure of relationships and how this embeddedness perspective relates to social contagion and conspiracies.

Brown, D. (1998). Cybertrends: Chaos, Power & Accountability in the Information Age. London, Penguin. Review © Robyn Cook, 1999

In Cybertrends, David Brown presents an alternative view to the technological utopia promoted by the leading digital prophets of our time. He argues that the digital revolution is based less on the inevitability of technological progress to improve living standards and promote an egalitarian global society; rather, he suggests, the technological revolution is driven by companies whose sole interest is to capture new commercial markets. Cyberspace, according to Brown, has become the new frontier, the "wired west" of the global economy, and those who capture the new markets reap momentous financial rewards. Citing Bill Gates, who promotes the "total participation" of users and markets as a key element of global networking systems, Brown suggests the digerati have in fact "confused their own vested interests with the technological destiny they promote." What we have at the end of the twentieth century is a new form of global imperialism based on silicon and code rather than geographic boundaries, driven by multinational "superpowers" increasingly less accountable to governments and whose sole aim is the increased profits that come with domination of global markets. Throughout history, individuals and nations who have controlled the latest technological tools have often played a decisive role in the acquisition of power and wealth. Brown acknowledges the emergence of Cyberspace has already led to momentous social change, and digital technology is already altering our methods of communication, our means of livelihood, our attitudes to consumerism and may ultimately impact on the future of democracy. Brown's major argument is that important social issues are being overshadowed by economic rationalism and global deregulation which, in contrast to the claims of the digerati, is, in reality, leading to a widening imbalance of wealth and opportunity. In a world where only 1 in 5 people have access to a basic telephone service, the small percentage of people connected to the Internet form a new subset of technological elite. Brown suggests that there should be less emphasis on technical gadgetry and the popular sales pitch of pundits, and more focus on who has control of the technology, who will arbitrate public debate, and who will decide standards. Important as these issues are, the problem with Brown's approach is the clumsy and confusing manner in which he approaches his argument. His jumpy and journalistic style is indicative of popular writing on technological trends, where a conversational tone is used to reach a mass audience, even at cost to the issues at stake. This book might have been more appropriately released in hypertext format, for on some pages there is more text related to footnotes than there is to the continuation of Brown's own argument. The use of analogy and personal anecdote is staggering both in its overuse and, at times, complete irrelevance. In one chapter alone we cycle through France, recall the Middle Ages, reminisce about the DC3, return again to the rural village in southern France with Miss B., and on to a small town in Italy to test drive a Lamborghini (a comparison between mechanical and computing power, get it?). All this to illustrate um..... oh yes, the emergence of the new elite, who are building their power and wealth on digital enterprises rather than the industrial or feudal models of old. The most troubling aspect of Cybertrends is that much of Brown's argument lacks

balance. He frequently resorts to broad, sweeping oversimplifications of complex issues to substantiate a point, and in doing so loses much of the power his argument. Emphasising the danger inherent in a society driven by computational machines Brown states that "it took the explosions of two world wars finally to resolve disjunctions set in train by the industrial age." Despite colonialism, politics, and a host of other equally complex attributing factors which led to the outbreak of the each world war, recent events in the last decade suggest these "disjunctions" are in no way resolved. The other drawback with Brown's writing is an excessive use of emotive language. We are left with no doubt who the villains are, and whilst I enjoyed many of his swipes at the more outlandish claims of Negroponte, Gates and their ilk, (together with a fair amount of multinational bashing), Brown's clear personal bias in many ways undermines the importance of his argument. To Brown's credit, his aim is, at all times, to place technological development within a humanistic context, to shift the debate away from globalisation and the economic might of the market place towards issues of social value. For this alone his argument is both important and worth consideration. I just wish he had been more succinct and a little less obvious. As a reader, I prefer to make up my own mind.

Brown, J. S. and P. Duguid (2001). "Knowledge and organization: A social-practice perspective." Organization Science **12**(2): 198-213.

While the recent focus on knowledge has undoubtedly benefited organizational studies, the literature still presents a sharply contrasting and even contradictory view of knowledge, which at times is described as "sticky" and at other times "leaky." This paper is written on the premise that there is more: than a problem with metaphors at issue here, and more than accounts of different types of knowledge (such as "tacit" and "explicit") can readily explain. Rather, these contrary descriptions of knowledge reflect different, partial, and sometimes "balkanized" perspectives from which knowledge and organization are viewed. Taking the community of practice as a unifying unit of analysis for understanding knowledge in the firm, the paper suggests that often too much attention is paid to the idea of community, too little to the implications of practice. Practice, we suggest, creates epistemic differences among the communities within a firm, and the firm's advantage over the market lies in dynamically coordinating the knowledge produced by these communities despite such differences. In making this argument, we argue that analyses of systemic innovation should be extended to embrace all firms in a knowledge economy, not just the classically innovative. This extension will call for a transformation of conventional ideas coordination and of the trade-off between exploration and exploitation.

Brunn, S. D. and S. R. O'Lear (1999). "Research and communication in the "invisible college" of the Human Dimensions of Global Change." Global Environmental Change-Human and Policy Dimensions **9**(4): 285-301.

The human dimensions of global change research community includes scholars in the natural and social sciences working in universities and government laboratories who share common interests and who communicate with each other through journals, workshops, and conferences and via the Internet. Information and communication technologies, in particular, e-mail, listservs, and the WWW, where speed and low cost are key features, form the backbone of an "electronic invisible college". The results of a survey of scientists attending the Laxenburg conference in 1997 illustrates the transdisciplinary and international nature of HDGC research, the local and international scale of research, their commitment to public policy, and their increased use of the Internet for networking, data acquisition and analysis, and publication. (C) 1999 Published by Elsevier Science Ltd. All rights reserved.

Burkhardt, M. E. and D. J. Brass (1990). "Changing Patterns or Patterns of Change - the Effects of a Change in Technology on Social Network Structure and Power." Administrative Science Quarterly **35**(1): 104-127.

Burt, R. S. (1991). "Measuring Age as a Structural Concept." Social Networks **13**(1): 1-34.

Burt, R. S. (1997). "The contingent value of social capital." Administrative Science Quarterly **42**(2): 339-365.

I present argument and evidence for a structural ecology of social capital that describes how the value of social capital to an individual is contingent on the number of people doing the same work. The information and control benefits of bridging the structural holes-or, disconnections between nonredundant contacts in a network-that constitute social capital are especially valuable to managers with few peers. Such managers do not have the guiding frame of reference for behavior provided by numerous competitors, and the work they do does not have the legitimacy provided by numerous people doing the same kind of work. I use network and performance data on a probability sample of senior managers to show how the value of social capital, high on average for the managers, varies as a power function of the number of people doing the same work.

Burt, R. S., R. M. Hogarth, et al. (2000). "The social capital of French and American managers." Organization Science **11**(2): 123-147.

Accumulating empirical evidence on American managers shows that social-capital effects on performance are a function of the information and control benefits of bridging structural holes- the disconnections between nonredundant contacts in a network. Is that network form of social capital unique to Americans? France seemed to us a productive site for comparative research because the image from past research is that French managers are more regulated than Americans; more regulated by bureaucratic authority and more regulated by peer pressure, with both amplified by the greater reliance in France on internal labor markets. People comfortable with knowing their place in a chain of bureaucratic control could be uncomfortable with the negotiated control exercised by network entrepreneurs, so the positive association between structural holes and performance in the United States could be negligible or even reversed for French managers. We use network and performance data on two study populations of senior managers, one in France and one in the United States, to describe social capital similarities and differences between the populations. The network form of social capital is similar in the two populations: More successful French managers, like Americans, tend to have networks rich in structural holes. The French and American managers make similar distinctions between kinds of relationships. Relations that bridge structural holes are similarly detached from routine work activities for the French and the Americans. The interesting difference is that social capital develops differently in the two populations. The French managers operate with a less porous social boundary around their firm and associate negative emotions with bridge relations. Reinforcing Aix-en-Provence observations on the significance of adult education for France-German differences in organization, we find that exposure to peers in other firms via executive education is for our French managers the only factor positively associated with the social capital of bridge relationships.

Butler, B. S. (2001). "Membership size, communication activity, and sustainability: A resource-based model of online social structures." Information Systems Research **12**(4): 346-362.

As telecommunication networks become more common, there is an increasing interest in the factors underlying the development of online social structures. It has been proposed that these structures are new forms of organizing which are not subject to the same constraints as traditional social structures. However, from anecdotal evidence and case studies it is difficult to evaluate whether online social structures are subject to the same problems as traditional social structures. Drawing from prior studies of traditional social structures and empirical analyses of longitudinal data from a sample of Internet-based groups, this exploratory work considers the role of size and communication activity in sustainable online social structures. A resource-based theory of sustainable social structures is presented. Members contribute time, energy, and other resources, enabling a social structure to provide benefits for individuals. These benefits, which include information, influence, and social support, are the basis for a social structure's ability to attract and retain members. This model focuses on the system of opposing forces that link membership size as a component of resource availability and communication activity as an aspect of benefit provision to the sustainability of an online social structure. Analyses of data from a random sample of e-mail-based Internet social structures (listservs) indicate that communication activity and size have

both positive and negative effects on a structure's sustainability. These results suggest that while the use of networked communication technologies may alter the form of communication, balancing the opposing impacts of membership size and communication activity in order to maintain resource availability and provide benefits for current members remains a fundamental problem underlying the development of sustainable online social structures.

Carley, K. M. (1999). Learning within and among organizations. Advances in Strategic Management, Vol 16 - 1999. **16**: 33-53.

Change is readily seen both within organizations and within populations of organizations. Such change has been characterized as organization or population-level learning or evolution. Underlying such change is change at the individual human and social network level. Herein, it is asked, how does the way in which individuals learn and the way in which networks evolve reflect itself in organizational and population-level learning? What changes should emerge at the organization and population level due to learning, information diffusion, and network change at the individual level? Herein it is argued that organization and population-level phenomena, such as performance improvements, mis-learning, and shakeouts, emerge from the on-going processes of change at the individual level. Looking at learning and information diffusion enables the organizational theorist to link micro and macro level organizational phenomena.

Carley, K. M. (2003). Dynamic Network Analysis. Summary of the NRC workshop on Social Network Modeling and Analysis. R. Breiger and K. M. Carley, National Research Council.

Carlson, J. R. and R. W. Zmud (1999). "Channel expansion theory and the experiential nature of media richness perceptions." Academy of Management Journal **42**(2): 153-170.

Experiences identified by channel expansion theory as contributing to media-use knowledge bases were hypothesized to be positively related to the perceived richness of a communications channel. We investigated the hypotheses, using electronic mail as the channel, in both a cross-sectional and a multiwave study. Results varied for types of experience and generally supported channel expansion theory. Channel use, perceived social influence, and the dynamic nature of richness perceptions were also investigated. Implications of these findings are discussed.

Carneiro, A., A. Simoes, et al. (2000). "Enlightenment science in Portugal: The estrangeirados and their communication networks." Social Studies of Science **30**(4): 591-619.

This paper focuses on the role of the estrangeirados ('Europeanized' intellectuals) as significant diffusion channels for the new scientific and technological ideas and practices stemming from the Scientific Revolution and the Enlightenment. A definition of 'network' is introduced in this paper as a methodological tool to characterize the estrangeirados. We argue that given their heterogeneous social origins, backgrounds and careers, they should not be seen as a homogeneous group. Rather, they were part of a fluid network, although they did not consider themselves as such. What they definitely shared was a common scientific culture. Analysis of the links they established on a voluntary and often informal basis accordingly enables us to identify the aims and strategies deployed to introduce the new sciences in 18th-century Portugal, and to understand better why their reforming endeavours had so little practical impact. In effect, the estrangeirados formed an elite which remained marginal to Portuguese society at large. In many instances their political options and their links to central power made them vulnerable to political and religious persecution. This considerably undermined their agenda, which aimed at bringing the country into the forefront of advanced European nations.

Carpenter, D. P., K. M. Esterling, et al. (1998). "The strength of weak ties in lobbying networks - Evidence from health-care politics in the United States." Journal of Theoretical Politics **10**(4): 417-444.

How does policy information flow through Washington 'issue networks'? And how does information how determine which lobbyists get access in policy-making? Drawing upon the 'strength of weak ties' argument, the authors argue that policy information passes more through acquaintances ('weak ties') than through close, trusted contacts ('strong ties'). They support this

argument in an analysis of data on lobbying networks in healthcare policy-making in the 1970s and 1980s. The statistical analyses show that access to policy-makers in Washington is network-autocorrelated: a lobbyist's access depends upon the access of other lobbyists s/he knows. The results demonstrate the importance of weak ties as a restricted form of 'social capital' in policy-making.

Carpenter, M. A. and J. D. Westphal (2001). "The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making." Academy of Management Journal **44**(4): 639-660.

This study examines how external network ties determine a board's ability to contribute to the strategic decision making process. Although the simple number of director appointments to other boards does not affect board monitoring or advice on strategy, appointments that can provide directors with relevant strategic knowledge and perspective do predict such involvement. In effect, the strategic context of social network ties, not simply the number of ties, is an important influence on corporate governance.

Carroll, G. R. and A. C. Teo (1996). "On the social networks of managers." Academy of Management Journal **39**(2): 421-440.

Using data from the National Opinion Research Center's General Social Survey, we compared the organizational membership networks and core discussion networks of managers and nonmanagers. For the two groups, the networks differed on a variety of characteristics, including ties to outside organizations and to co-workers, network size, and closeness of ties. We also found preliminary evidence that network differences were associated with income differences for nonmanagers.

Chang, H. J. and J. D. Johnson (2001). "Communication networks as predictors of organizational members' media choices." Western Journal of Communication **65**(4): 349-369.

This study relates Burt's social contagion theory to organizational members' perceptions of two models of media choice. The data (N = 83) were drawn from telephone mediated interpersonal communication within the Cancer Information Service (CIS), a government health information services agency that specializes in disseminating technical information. The results indicated, as hypothesized, that social contagion by structural equivalence was related to media richness. However, little support was found for a cohesion explanation of social information processing. These results have a number of implications for the development of new organizational forms, the role of multiplexity, and the competitiveness or complementarity of the theoretical perspectives examined here.

Chung, S., H. Singh, et al. (2000). "Complementarity, status similarity and social capital as drivers of alliance formation." Strategic Management Journal **21**(1): 1-22.

Using data on U.S. investment banking firms' syndication in underwriting corporate stock offerings during the 1980s, this study explores the factors that drive alliance formation between two specific firms. We compare resource complementarity, status similarity, and social capital as a basis of alliance formation. The findings indicate that the likelihood of investment banks' alliance formation is positively related to the complementarity of their capabilities, as well as their status similarity. Social capital arising from banks' direct and indirect collaborative experiences also plays a very important role in alliance formation. The number of deals given by a lead bank to a potential partner over the past three years has an inverted U-shaped relationship to the probability that the lead bank will invite the potential partner to form an alliance. Our findings indicate that status similarity and social capital have a stronger effect on alliance formation in initial public offering deals than in secondary offering deals, as the former are more uncertain than the latter. Using these findings, we discuss the role of complementarity, status similarity, and social capital in alliance formation.

Chwe, M. S. Y. (1999). "Structure and strategy in collective action." American Journal of Sociology **105**(1): 128-156.

This article considers both structural and strategic influences on collective action. Each person in a group wants to participate only if the total number taking part is at least her threshold; people use a network to communicate their thresholds. People are strategically rational in that they are completely rational and also take into account that others are completely rational. The model shows first that network position is much more important in influencing the revolt of people with low thresholds than people with high thresholds. Second, it shows that strong links are better for revolt; when thresholds are low, and weak links are better when thresholds are high. Finally, the model generalizes the threshold models of Schelling (1978) and Granovetter (1978) and shows that their findings that revolt is very sensitive to the thresholds of people "early" in the process depends heavily on the assumption that communication is never reciprocal.

Constant, D., L. Sproull, et al. (1996). "The kindness of strangers: The usefulness of electronic weak ties for technical advice." Organization Science 7(2): 119-135.

People use weak ties-relationships with acquaintances or strangers-to seek help unavailable from friends or colleagues. Yet in the absence of personal relationships or the expectation of direct reciprocity, help from weak ties might not be forthcoming or could be of low quality. We examined the practice of distant employees (strangers) exchanging technical advice through a large organizational computer network. A survey of advice seekers and those who replied was conducted to test hypotheses about the viability and usefulness of such electronic weak tie exchanges. Theories of organizational motivation suggest that positive regard for the larger organization can substitute for direct incentives or personal relationships in motivating people to help others. Theories of weak ties suggest that the usefulness of this help may depend on the number of ties, the diversity of ties, or the resources of help providers. We hypothesized that, in an organizational context, the firm-specific resources and organizational motivation of people who provide advice will predict the usefulness of advice. We investigated these theories in a study of employees of a global computer manufacturer. We collected survey and observational data on the relationships between information seekers and information providers; the number, diversity, resources, and motivations of information providers, and subjective ratings of the usefulness of the advice (from both parties in the exchange) and whether or not the advice solved information seekers' problems. We found that information providers gave useful advice and solved the problems of information seekers, despite their lack of a personal connection with the seekers. The data support the main hypotheses and provide some support for resource and diversity explanations of weak tie influence. We discuss how this organization's culture sustained useful information exchange through weak ties.

Contractor, N. and A. P. Bishop (2000). Reconfiguring community networks: The case of PrairieKNOW. Digital Cities. 1765: 151-164.

The advent of the Web has renewed interest in the use of information and communication technologies to support not only virtual communities but also traditional communities. This paper observes that the majority of successful applications to date tend to use technologies to substitute for and/or enlarge existing community interactions and transactions. We argue that this trend, unfortunately, deepens the digital divide between those who have social and knowledge capital and those who don't. In order to improve the conditions of low-income residents, there is a need to deploy tools that help to reconfigure rather than simply substitute or enlarge existing community interactions. This paper describes the methodology of asset mapping and the development and deployment of a tool called PrairieKNOW (Prairie Knowledge Networks On the Web) in Champaign-Urbana, Illinois' Prairienet community network. While Champaign-Urbana was ranked by Newsweek magazine as one of the ten: most wired cities in the world, it also has a substantial low-income population that has traditionally been under- represented in their use of Prairienet.

Cooke, P. and D. Wills (1999). "Small firms, social capital and the enhancement of business performance through innovation programmes." Small Business Economics 13(3): 219-234.

The paper explores the extent to which social capital is advantageous to small and medium enterprise (SME) growth. Social capital is a communal property involving civic engagement, associational membership, high trust, reliability and reciprocity in social networks. It is capable of being identified in social, political and economic contexts, often associated with strong communities. However, not all strong communities exert the effects of social capital in respect of business activities. This paper assesses government programmes to promote collaboration amongst SMEs for improving innovation capacity by increasing social capital through networking. It shows that, for a sizeable proportion of programme-funded firms in Denmark, Ireland and Wales (U.K.) social capital building was associated with enhanced business, knowledge and innovation performance. Of particular importance was the opportunity afforded to firms for linkage with external innovation networks, and the build-up of embeddedness, or the institutional basis for the enhancement of social capital. As a consequence of discovering the advantages of social capital, over a third of respondents planned to continue to develop it in future, in many cases funding such activities privately rather than calling on the public purse.

Cross, R., A. Parker, et al. (2001). "Knowing what we know: Supporting knowledge creation and sharing in social networks." *Organizational Dynamics* 30(2): 100-120.

Despite the ubiquity and increasing ease of access to vast stores of data, people still rely heavily on other people for information and problem solving. Executives must pay more attention to the sets of relationships that people rely on for these purposes. This article reports results from a research program designed to help managers probe knowledge creation, sharing and learning in strategically important networks of employees.

Cummings, J. N. (2001). *Work Groups and Knowledge Sharing in a Global Organization*, Carnegie Mellon University.

Groups incur a number of internal costs when members work in different geographic locations and represent different functional areas. For example, it can be difficult for distributed group members to develop a common understanding of the task, or for cross-functional group members to reconcile dissimilar points of view. Relatively little scholarly attention, however, has been given to the external benefits that distributed or cross-functional group members have available to them. These include access to diverse sources of knowledge, such as customers in a variety of locations or non-group employees from different functions. Past studies have shown a positive relationship between external knowledge sharing and work group performance. This thesis extends previous research by examining whether distributed or cross-functional groups benefit from external knowledge sharing more than co-located or functionally homogeneous groups. I surveyed 182 work groups in a Fortune 500 corporation to assess how often members shared general overviews, specific requirements, analytical techniques, progress reports, and project results within and outside of the group. Members were located around the world, they represented numerous functional areas, and they worked on tasks ranging from product development to manufacturing operations. Senior managers in the company rated each work group on their performance. I hypothesized and found that both internal and external knowledge sharing were positively related to group performance. Building on social network theory, I also hypothesized and found that as geographic distribution and cross-functionality increased, the relationship between external knowledge sharing and group performance became even stronger. These results suggest that external networks can provide distributed or cross-functional group members with access to unique task information, know-how, and feedback.

Cummings, J. N. (in press). "Works groups, structural diversity, and knowledge sharing in a global organization." *Management Science*.

Work groups in organizations must exchange information, know-how, and feedback among members and with the outside to be effective. Moreover, external knowledge sharing is likely to increase in importance as organizations create work groups with diverse structures – members who are dispersed across different geographic locations, who represent different functional assignments, who report to different managers, or who reside in different business units. Building

on social network theory, this paper argues that variation in features of group structure, termed structural diversity, can increase the value of external knowledge sharing by exposing members to unique sources of knowledge. Using corporate database records, group member surveys, and senior executive's ratings of performance, a field study of 182 work groups in a global organization reveals that external knowledge sharing is more strongly associated with performance when groups have greater structural diversity. In contrast, groups with greater demographic diversity, such as member differences in sex, age, and tenure, do not reap the same performance benefits from external knowledge sharing.

Cummings, J. N. and R. Cross (2003). "Structural properties of work groups and their consequences for performance." Social Networks 25(3): 197-281.

Over the past several decades, social network research has favored either ego-centric (e.g. employee) or bounded networks (e.g. organization) as the primary unit of analysis. This paper revitalizes a focus on the work group, which includes structural properties of both its individual members and the collection as a whole. In a study of 182 work groups in a global organization, we found that structural holes of leaders within groups as well as core-periphery and hierarchical group structures were negatively associated with performance. We show that these effects hold even after controlling for mean levels of group communication, and discuss implications for the future of network analysis in work groups and informal organizations.

Daveni, R. A. and I. F. Kesner (1993). "Top Managerial Prestige, Power and Tender Offer Response - a Study of Elite Social Networks and Target Firm Cooperation During Takeovers." Organization Science 4(2): 123-151.

In this paper we explore the following research question: When faced with a tender offer, why do some firms resist and others cooperate? In the past, researchers have suggested that the manner in which firms respond to takeover attempts may be, in part, a function of managers' personal motivations. We contribute to this line of research by questioning whether other factors might be involved. Specifically, we examine whether cooperation may be a function of the friendliness of the bidding company and the social networks shared by executives in the two firms (i.e., bidder and target). We examine how the power and connections of managers affect their responses to tender offers. Our results suggest that these factors do indeed play a role. We found, for example, that target managers are more likely to cooperate under two conditions: (1) if they have less prestigious connections than managers in the bidding firm, and (2) if the target and bidding firms share numerous ties to the same prestigious networks. In contrast, we found that target managers are more likely to resist a bidder's advances if: (1) the managers in both firms are poorly connected, or (2) the targets' managers hold more prestigious connections relative to the bidders. Together these findings suggest that cooperation and resistance may be a function of the social networks and power relationships that exist between and within firms. We discuss our findings within the framework of numerous organizational theories such as social class and social network theory, agency theory, and resource dependence. Although each of these perspectives suggests somewhat different results, we propose a reconciliation of these various perspectives. Specifically, we suggest that the variables of managerial power and connections may have different effects depending on whether we are observing firms before or after tender offers are made. It may be, for instance, that before a takeover offer is received, the power and prestige of target managers is associated with adoption of anti-takeover defenses (i.e., defenses designed to thwart takeover attempts). In fact, this finding has already been well documented in the literature. On the other hand, our findings suggest that after an offer is received, these same factors of prestige and power appear to be associated with resistance. Finally, our results call into question previous views that corporate takeovers are a mechanism for disciplining or ridding the company of incompetent managers. Instead, our findings suggest that the nature of the takeover process (i.e., cooperative versus resistant) may do little more than perpetuate existing social structures. Powerful and prestigious managers may not suffer the same negative effects of takeovers as their less prestigious and less powerful counterparts.

Davis, G. F. (1991). "Agents without Principles - the Spread of the Poison Pill through the Intercorporate Network." Administrative Science Quarterly **36**(4): 583-613.

This study compares the agency theory of the firm with interorganizational theory in examining the factors associated with the adoption of the poison pill-a takeover defense issued by a firm's board of directors that can dramatically increase the cost that a hostile buyer would have to pay to acquire the firm-by a panel of Fortune 500 firms between July 1984 and August 1989. The pill's rapid spread is traced to a combination of ownership structure and other firm-level factors and an interlock network diffusion process. The results support a social structural perspective on the market for corporate control in which the interlock network provides a social context favoring continued managerial dominance. The findings are also more consistent with models of cohesion rather than structural equivalence as the social structural mechanism responsible for diffusion.

Davis, G. F. and H. R. Greve (1997). "Corporate elite networks and governance changes in the 1980s." American Journal of Sociology **103**(1): 1-37.

Changes in corporate governance practices can be analyzed by linking the adaptations of individual firms to the structures of the networks in which firms' decision makers are embedded. Network structures determine the speed of adaptation and ultimate patterns of prevalence of governance practices by exposing a firm to particular role models and standards of appropriateness. The authors compare the spreads of two governance innovations adopted in response to the 1980s takeover wave: poison pills (which spread rapidly through a board-to-board diffusion process) and golden parachutes (which spread slowly through geographic proximity). The study closes with a discussion of networks as links between individual adaptation and collective structures.

Davis, G. F. and M. S. Mizruchi (1999). "The money center cannot hold: Commercial banks in the US system of corporate governance." Administrative Science Quarterly **44**(2): 215-239.

This paper examines how the place of banks in the intercorporate network has changed as a result of their decreasing role as financial intermediaries in the U.S. economy. An analysis of comprehensive data on the boards of the fifty largest banks and their connections with the several hundred largest nonbank corporations from 1982 to 1994 shows that the centrality of banks has significantly declined as executives of major corporations, particularly those representing central firms, joined bank boards at a substantially lower rate. Declining centrality reflects a strategic choice on the part of the banks: as the returns available from lending to major corporations have declined, the largest banks have moved into other forms of business and reduced their recruiting of centrally located directors. We conclude with a discussion of the role of financial intermediation in shaping the social organization of the economy.

Degenne, A. and M. Forse (1999). Introducing Social Networks. London, Sage.

Dess, G. G. and J. D. Shaw (2001). "Voluntary turnover, social capital, and organizational performance." Academy of Management Review **26**(3): 446-456.

We propose a supplemental perspective, based on organizational social capital, for examining the voluntary turnover- organizational performance relationship. We view existing organizational-level theories as those focusing on cost or human capital issues or, rarely, on a balance among these factors. But rapid changes in the nature of work, organizational structures, and interorganizational competitiveness increase the importance of studying the role of social capital in the voluntary turnover-organizational performance relationship. We highlight areas of correspondence and divergence among the various perspectives, discuss implications for various performance measures, and outline several research directions.

DiMaggio, P. and H. Louch (1998). "Socially embedded consumer transactions: For what kinds of purchases do people most often use networks?" American Sociological Review **63**(5): 619-637.

Why and to what extent do people make significant purchases from people with whom they have prior noncommercial relationships? Using data from the economic sociology module of the 1996

General Social Survey, we document high levels of within-network exchanges. We argue that transacting with social contacts is effective because it embeds commercial exchanges in a web of obligations and holds the seller's network hostage to appropriate role performance in the economic transaction. It follows that within-network exchanges will be more common in risky transactions that are unlikely to be repeated and in which uncertainty is high. The data support this view. Self-reports about major purchases are consistent with the expectation that exchange frequency reduces the extent of within-network exchanges. Responses to questions about preferences for in-group exchanges support the argument that uncertainty about product and performance quality leads people to prefer sellers with whom they have noncommercial ties. Moreover, people prefer to avoid selling to social contacts under the same conditions that lead buyers to seek such transactions; and people who transact with friends and relatives report greater satisfaction with the results than do people who transact with strangers, especially for risk-laden exchanges.

Erickson, B. (1988). The relational basis of attitudes. Social Structures: A Network Approach. B. S. Wellman and S. D. Berkowitz. Cambridge, MA, Cambridge University Press.

Fernandez, R. M. (1991). "Structural Bases of Leadership in Intraorganizational Networks." Social Psychology Quarterly **54**(1): 36-53.

Fiol, C. M., E. J. O'Connor, et al. (2001). "All for one and one for all? The development and transfer of power across organizational levels." Academy of Management Review **26**(2): 224-242.

Power in organizations is a fluid social construction subject to multiple interpretations. The extensive literature on power provides insights about the antecedents and consequences of power at the individual and group levels but does not provide a model tracing the linkages between them and describing how power develops and is transferred between individuals and groups. In this article we describe some of the conditions necessary for power identities and reputations to develop and transfer effectively between individuals and groups in organizations.

Flache, A. (2002). "The rational weakness of strong ties: Failure of group solidarity in a highly cohesive group of rational agents." Journal of Mathematical Sociology **26**(3): 189-216.

Recent research (Flache, 1996; Flache and Macy, 1996) suggests a "weakness of strong ties." Cohesive social networks may undermine group solidarity, rather than sustain it. In the original analysis, simulations showed that adaptive actors learn cooperation in bilateral exchanges faster than cooperation in more complex group exchanges, favoring ties at the expense of the common good. This article uses game theory to demonstrate that cognitive simplicity is not a scope condition for the result. The game theoretical analysis identifies a new condition for the failure of group solidarity in a cohesive group. Task uncertainty may make rational cooperation increasingly inefficient in common good production. Accordingly, rational actors may increasingly sacrifice benefits from common good production in order to maintain social ties, as their dependence on peer approval rises.

Flap, H. and B. Volker (2001). "Goal specific social capital and job satisfaction - Effects of different types of networks on instrumental and social aspects of work." Social Networks **23**(4): 297-320.

This paper addresses the question "To what extent can job satisfaction be explained as the revenue of social capital?" By conceiving someone's social network as social capital we specify conditions under which social ties do lead to job satisfaction. We inquire into the idea of goal specificity of social capital, which implies that a network with a given structure and content will have different impacts on various aspects of job satisfaction. If the content of the ties and the structure of the network at the job engender material well-being or produce social approval, satisfaction with the corresponding job aspects increases. Data were collected in 1993 using written questionnaires in two Dutch governmental agencies, one with 32 and the other with 44 employees. These workers' networks were charted using nine name-generating questions. Social capital, it turns out, is not an all-purpose good but one that is goal specific, even within a single domain of life such as work. Three effects stand out: First, the structure of the network and the content of the ties do matter.

Networks of strategic, work-related ties promote an employee's satisfaction with instrumental aspects of the job, like income, security, and career opportunities. Second, closed networks of identity-based solidarity ties improve an employee's satisfaction with social aspects of the job, like the general social climate at work and cooperation with management and colleagues. Third, a network with a bow-tie structure (i.e., where a focal actor is the link between two or more mutually exclusive cliques) generally has strong negative effects on satisfaction with the social side of the job; although a bow-tie type network of trusting ties does increase satisfaction with the social side. This implies that Krackhardt's hypothesis on the unpleasant feelings produced by bow-tie type networks has to be specified for the content of the ties that constitute such a network. The most important conclusion of our analysis is that goal specificity of social capital has implications for both structure and content of social networks. Achievement of a particular goal, such as satisfaction at work, requires not only networks of a certain structure or ties with a particular content, but specifically structured networks of ties with a particular content. (C) 2001 Published by Elsevier Science B.V.

Fountain, J. E. (1998). "Social capital: its relationship to innovation in science and technology." Science and Public Policy **25**(2): 103-116.

This paper argues that social capital is a necessary, although not sufficient, enabler of effective public-private partnerships and of a new, more collaborative style of innovation policy, although its significance for science and technology policy, has yet to be assimilated by most policy-makers. The network structure of the biotechnology industry in the United States and the regional-based industrial system in Silicon Valley, California are used to show how social capital affects innovation in science and technology. Two US national policy programs - the Advanced Technology Program and the Manufacturing Extension Partnership - make evident the growing importance of network development. A set of recommendations is given, designed to enhance innovative capacity through the formation of social capital. The central arguments regarding social capital and its relationship to innovation transcend national boundaries, and many of the specific policy recommendations for western European and some East Asian industrial states.

Freeman, L. C. (1992). "The Sociological Concept of Group - an Empirical-Test of 2 Models." American Journal of Sociology **98**(1): 152-166.

Two models of the structural form of small, informal groups are compared. One, derived by Winship, requires that patterns of social affiliation be strictly transitive. The other, based on Granovetter's ideas about weak and strong ties, requires only a special limited form of transitivity. When these alternative models are tested with data on human interaction, it turns out that the Winship model does not fit the data but that the model developed from Granovetter's work does.

Friedkin, N. E. (1993). "Structural Bases of Interpersonal Influence in Groups - a Longitudinal Case-Study." American Sociological Review **58**(6): 861-872.

I examine the relationship between interpersonal power and influence during the resolution of an issue in an organization. Controlling for elementary bases of power (rewards, coercion, authority, identification, and expertise), I investigate three bases of power that arise from the structure of social networks (cohesion, similarity, and centrality). An analysis of longitudinal data on actors' bases of social power, frequency of interpersonal communications, and interpersonal influences indicates that cohesion, similarity, and centrality have significant effects on issue-related influence net of the elementary power bases. The effects of the structural bases are mediated by the frequency of issue-related communication. The primary structural determinant of the frequency of issue-related communication is network cohesion.

Friedkin, N. E. (1999). "Choice shift and group polarization." American Sociological Review **64**(6): 856-875.

I extend the theoretical domain of sociology into an area of social psychology that heretofore has been the exclusive domain of psychologists. Specifically, I develop a social structural perspective on the choice shifts made within groups. During interpersonal discussions of issues, choice shifts

occur when there is a difference between group members' mean final opinion and their mean initial opinion. Explanations of choice shifts have emphasized group-level conditions (e.g., a norm, a decision rule, a pool of persuasive arguments, a distribution of initial opinions). I argue that choice shifts are a ubiquitous product of the inequalities of interpersonal influence that emerge during discussions of issues. Hence, I bring choice shifts squarely into the domain of a structural social psychology that attends to the composition of networks of interpersonal influence and into broader sociological perspectives concerned with the formation of status structures.

Gargiulo, M. and M. Benassi (2000). "Trapped in your own net? Network cohesion structural holes, and the adaptation of social capital." *Organization Science* **11**(2): 183-196.

This paper explores the tension between two opposite views on how networks create social capital. Network closure (Coleman 1988) stresses the role of cohesive ties in fostering a normative environment that facilitates cooperation. Structural hole theory (Burt 1992) sees cohesive ties as a source of rigidity that hinders the coordination of complex organizational tasks. The two theories lead to opposite predictions on how the structure of an actor's network may affect his ability to adapt that network to a significant change in task environment. Using data from a newly created special unit within the Italian subsidiary of a multinational computer manufacturer, we show that managers with cohesive communication networks were less likely to adapt these networks to the change in coordination requirements prompted by their new assignments, which in turn jeopardized their role as facilitators of horizontal cooperation within a newly created business unit structure. We conclude with a discussion of the trade-off between the safety of cooperation within cohesive networks and the flexibility provided by networks rich in structural holes.

Geletkanycz, M. A., B. K. Boyd, et al. (2001). "The strategic value of CEO external directorate networks: Implications for CEO compensation." *Strategic Management Journal* **22**(9): 889-898.

This study examines the relationship between CEO external directorate networks and CEO compensation. Drawing on previous research showing a link between executives' external networks, firm strategy, and performance, the study argues that executive external networks are strategically valuable to firms; thus, they should be reflected in executive compensation. The study further examines whether firm diversification, with its elevated demand for strategic resources, moderates the relationship between CEO external directorate networks and pay. Hypotheses are tested using a sample of 460 Fortune 1000 firms. Analyses reveal that the rewards to CEO external directorate networks are contingent upon the firm's level of diversification. Implications for future research and practice are discussed.

Gersick, C. J. G., J. M. Bartunek, et al. (2000). "Learning from academia: The importance of relationships in professional life." *Academy of Management Journal* **43**(6): 1026-1044.

In-depth interviews with business school faculty members suggest that work relationships are more than strategically chosen means to career mobility. Relationships are career-defining ends as well, and negative relationships may be as consequential as helpful ties. Findings also showed significant gender differences: women, more than men, told stories about harm; men, more than women, told stories about help. Workplace relationships may play different roles for professionals and managers, and men's and women's different relational experiences may foster different career logics, or ways of striving for success.

Gould, R. V. (1993). "Trade Cohesion, Class Unity, and Urban Insurrection - Artisanal Activism in the Paris Commune." *American Journal of Sociology* **98**(4): 721-754.

Sociologists and historians generally agree that working-class protest in 19th-century France relied on the close-knit networks and corporate solidarity of artisanal trades. But urban uprisings invariably mobilized workers from a broad range of trades, a fact which some scholars have interpreted as evidence of growing class consciousness among French workers. This article shows that social organization within trade groups cannot account for insurgency in the Paris Commune: workers from close-knit occupational groups participated at lower rates than those in weakly organized trades. The reason was that Parisian workers were mobilized for insurgency through

neighborhood networks, not through their membership in craft groups. The disappearance of trade boundaries during insurrections did not, therefore, reflect the emergence of class unity, but rather a shift from trade to neighborhood as the organizational framework for the mobilization of protest.

Gould, R. V. (1999). "Collective violence and group solidarity: Evidence from a feuding society." American Sociological Review **64**(3): 356-380.

Sociological explanations of group conflict usually presuppose that the various factors that breed hostility between collectivities also generate internal solidarity. Outside of the protest literature, studies of conflict therefore pay little attention to the collective-action problem facing groups in contention, and therefore overestimate the likelihood of group conflict: intergroup struggle is implicitly regarded as a sufficient condition for group participation in violent conflict. Examination of nineteenth-century court documents from Corsica, a society known for its tradition of collectivist feuding, shows that violent incidents typically did not involve groups. The group character of violence—in the form of collaborative use of lethal force and inclusion of disputants' kin—was conditional on collective contention having occurred before violence began. This and other empirical patterns support the view that collective violence occurs, then group action fails to convince an adversary to back down. The failure to prevent escalation calls the group's solidarity into question, compelling members to demonstrate that they are able to overcome their collective-action problem.

Grier, D. A. and M. Campbell (2000). "A social history of Bitnet and Listserv, 1985-1991." Ieee Annals of the History of Computing **22**(2): 32-41.

After the engineers built the computer networks, users had to build the social networks that made them useful. Listserv, the combined mailing list and file server, was an important tool for those interested in building network-based organizations. It first appeared on Bitnet, an academic network based on IBM computers. The early versions of Listserv became operational in the mid 1980s, and its early archives show how network users learned to use the software and, perhaps more importantly, how to manage network-based organizations.

Gulati, R. (1995). "Social structure and alliance formation patterns: A longitudinal analysis." Administrative Science Quarterly **40**(4): 619-652.

This study explores how social structure affects interfirm alliance formation patterns. It proposes that the social context emerging from prior alliances and considerations of strategic interdependence influence partnership decisions between firms. This social network facilitates new alliances by providing valuable information to firms about the specific capabilities and reliability of potential partners. The role of both direct ties between firms and their overall networks were examined with comprehensive longitudinal multi-industry data on the formation of interfirm strategic alliances between 1970 and 1989. Results are consistent with both strategic interdependence and social structural explanations of alliance formation. Support for the interaction of the two sets of factors also emerged. The implications of incorporating both sets of explanations for the formation of interorganizational ties are discussed.

Gulati, R. and M. Gargiulo (1999). "Where do interorganizational networks come from?" American Journal of Sociology **104**(5): 1439-1493.

Organizations enter alliances with each other to access critical resources, but they rely on information from the network of prior alliances to determine with whom to cooperate. These new alliances modify the existing network, prompting an endogenous dynamic between organizational action and network structure that drives the emergence of interorganizational networks. Testing these ideas on alliances formed in three industries over nine years, this research shows that the probability of a new alliance between specific organizations increases with their interdependence and also with their prior mutual alliances, common third parties, and joint centrality in the alliance network. The differentiation of the emerging network structure, however, mitigates the effect of interdependence and enhances the effect of joint centrality on new alliance formation.

Gulati, R. and J. D. Westphal (1999). "Cooperative or controlling? The effects of CEO-board relations and the content of interlocks on the formation of joint ventures." *Administrative Science Quarterly* **44**(3): 473-506.

This study examines the influence of the social network of board interlocks on strategic alliance formation. Our theoretical framework suggests how board interlock ties to other firms can increase or decrease the likelihood of alliance formation, depending on the content of relationships between CEOs (chief executive officers) and outside directors. Results suggest that CEO-board relationships characterized by independent board control reduce the likelihood of alliance formation by prompting distrust between corporate leaders, while CEO-board cooperation in strategic decision making appears to promote alliance formation by enhancing trust. The findings also show how the effects of direct interlock ties are amplified further by third-party network ties.

Hallinan, M. T. (1978). "Process of friendship formation." *Social Networks* **1**(2): 193-210.

Hansen, M. T. (1999). "The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits." *Administrative Science Quarterly* **44**(1): 82-111.

This paper combines the concept of weak ties from social network research and the notion of complex knowledge to explain the role of weak ties in sharing knowledge across organization subunits in a multiunit organization. I use a network study of 120 new-product development projects undertaken by 41 divisions in a large electronics company to examine the task of developing new products in the least amount of time. Findings show that weak interunit ties help a project team search for useful knowledge in other subunits but impede the transfer of complex knowledge, which tends to require a strong tie between the two parties to a transfer. Having weak interunit ties speeds up projects when knowledge is not complex but slows them down when the knowledge to be transferred is highly complex. I discuss the implications of these findings for research on social networks and product innovation.

Hansen, M. T. (2002). "Knowledge networks: Explaining effective knowledge sharing in multiunit companies." *Organization Science* **13**(3): 232-248.

This paper introduces the concept of knowledge networks to explain why some business units are able to benefit from knowledge residing in other parts of the company while others are not. The core premise of this concept is that a proper understanding of effective interunit knowledge sharing in a multiunit firm requires a joint consideration of relatedness in knowledge content among business units and the network of lateral interunit relations that enables task units to access related knowledge. Results from a study of 120 new product development projects in 41 business units of a large multiunit electronics company showed that project teams obtained more existing knowledge from other units and completed their projects faster to the extent that they had short interunit network paths to units that possessed related knowledge. In contrast, neither network connections nor extent of related knowledge alone explained the amount of knowledge obtained and project completion time. The results also showed a contingent effect of having direct interunit relations in knowledge networks: While established direct relations mitigated problems of transfer-ring noncodified knowledge, they were harmful when the knowledge to be transferred was codified, because they were less needed but still involved maintenance costs. These findings suggest that research on knowledge transfers and synergies in multiunit firms should pursue new perspectives that combine the concepts of network connections and relatedness in knowledge content.

Haunschild, P. R. and A. S. Miner (1997). "Modes of interorganizational imitation: The effects of outcome salience and uncertainty." *Administrative Science Quarterly* **42**(3): 472-500.

Drawing on neoinstitutional and learning theories, we distinguish three distinct modes of selective interorganizational imitation: frequency imitation (copying very common practices), trait imitation (copying practices of other organizations with certain features), and outcome imitation (imitation based on a practice's apparent impact on others). We investigate whether these imitation modes occur independently and are affected by outcome salience and contextual uncertainty in the

context of an important decision: which investment banker to use as adviser on an acquisition, Results of testing hypotheses on 539 acquisitions that occurred in 1988-1993 show that all three imitation modes occur independently, but only highly salient outcomes sustain outcome imitation, Uncertainty enhances frequency imitation, but only some trait and outcome imitation. The results highlight the possible joint operation of social and technical indicators in imitation, illuminate factors that moderate vicarious learning processes, and show asymmetries between learning from success and failure.

Hedstrom, P., R. Sandell, et al. (2000). "Mesolevel networks and the diffusion of social movements: The case of the Swedish Social Democratic Party." *American Journal of Sociology* **106**(1): 145-172.

In analyzing the spatial diffusion of the Swedish Social Democratic Party, this article introduces the notion of a mesolevel network. A mesolevel network is a social network that differs in three important respects from interpersonal microlevel networks directly linking prior and potential adopters of a practice to one another: (1) it is generated by a different causal process than the microlevel network; (2) it tends to be much sparser than the microlevel network; and (3) the typical edge of a mesolevel network bridges much longer sociometric and geographic distances than the typical edge of a microlevel network. These types of mesolevel networks are important because they can dramatically influence the speed at which a contagious practice will diffuse. The mesolevel network focused upon in this article is the network that emerged out of the travel routes of political agitators affiliated with the Social Democratic Party. Computational modeling shows that the diffusion of the Social Democratic Party is likely to have been considerably influenced by the structure of this network. Empirical analyses of the founding of party organizations during the period 1894-1911 support these theoretical predictions and suggest that this mesolevel network was of considerable importance for the diffusion of the Swedish Social Democratic Party.

Higgins, M. C. and K. E. Kram (2001). "Reconceptualizing mentoring at work: A developmental network perspective." *Academy of Management Review* **26**(2): 264-288.

We introduce social networks theory and methods as a way of understanding mentoring in the current career context. We first introduce a typology of "developmental networks" using core concepts from social networks theory-network diversity and tie strength-to view mentoring as ct multiple relationship phenomenon. We then propose a framework illustrating factors that shape developmental network structures and offer propositions focusing on the developmental consequences for individuals having different types of developmental networks in their careers. We conclude with strategies both for testing our propositions and for researching multiple developmental relationships further.

Hinds, P. J., K. M. Carley, et al. (2000). "Choosing work group members: Balancing similarity, competence, and familiarity." *Organizational Behavior and Human Decision Processes* **81**(2): 226-251.

This study explores one of the contributors to group composition-the basis on which people choose others with whom they want to work. We use a combined model to explore individual attributes, relational attributes, and previous structural ties as determinants of work partner choice. Four years of data from participants in 33 small project groups were collected, some of which reflects individual participant characteristics and some of which is social network data measuring the previous relationship between two participants, Our results suggest that when selecting future group members people are biased toward others of the same race, others who have a reputation for being competent and hard working, and others with whom they have developed strong working relationships in the past. These results suggest that people strive for predictability when choosing future work group members. (C) 2000 Academic Press.

Hite, J. M. and W. S. Hesterly (2001). "The evolution of firm networks: From emergence to early growth of the firm." *Strategic Management Journal* **22**(3): 275-286.

This paper addresses whether cohesive networks of socially embedded ties or sparse networks rich in structural holes are more conducive to the success of new firms. We propose that the networks of emerging firms evolve in order to adapt to the firm's changing resource needs and resource

challenges. As firms emerge, their networks consist primarily of socially embedded ties drawn from dense, cohesive sets of connections. We label these networks identity based. As firms move into the early growth stage, their networks evolve reward more ties based on a calculation of economic costs and benefits. This shift from identity-based to more calculative networks is manifested in the evolution of the firm networks: (1) from primarily socially embedded ties to a balance of embedded and arm's-length relations; (2) from networks that emphasize cohesion to those that exploit structural holes; and (3) from a more path-dependent to a more intentionally managed network. Thus, this paper suggests that both cohesive and sparse networks are conducive to firm performance when they are aligned with and address firms' evolving resource challenges.

Holland, P. W. and S. Leinhardt (1977). "Dynamic-Model for Social Networks." Journal of Mathematical Sociology 5(1): 5-20.

Hsu, J. Y. and A. Saxenian (2000). "The limits of guanxi capitalism: transnational collaboration between Taiwan and the USA." Environment and Planning A 32(11): 1991-2005.

In this research we explore the relationship between high- technology regional development and ethnic networks in the connection between Silicon Valley, California and Hsinchu, Taiwan. We elaborate the argument that regional industrial structure and embedded social networks, rather than the multinational firm, should be the focus in the study of transnational business. The complementary regional industrial structures allow economic and technological collaboration between these two regions while the social networks help coordinate these transnational (cross-regional) collaborations. However, we seek to distinguish this account from the dominant perceptions of the role of guanxi (interpersonal relationships) in overseas Chinese business networks (OCBN). In contrast with the arguments for OCBN, that guanxi provides resources for Chinese firms to coordinate and control transnational business, we argue that the skill and competence required for technological upgrading are not necessarily guaranteed within the ethnic network. Although ethnic networks facilitate transnational business and technology cross-fertilization, it seems to go too far to argue the Silicon Valley-Hsinchu connection is another version of Chinese guanxi capitalism.

Huxham, C. and S. Vangen (2000). "Leadership in the shaping and implementation of collaboration agendas: How things happen in a (not quite) joined-up world." Academy of Management Journal 43(6): 1159-1175.

This article contributes to the theory of collaboration in social settings and is based on data collected during action research interventions in a number of public and community interorganizational collaborations. We conceptualize leadership in collaborations as stemming from three leadership media- structures, processes, and participants- and argue that none of these is wholly within the control of the members of a collaboration. Leadership activities that participants undertake in order to move a collaborative agenda forward are described.

Ibarra, H. (1992). "Homophily and differential returns - sex differences in network structure and access in an advertising firm." Administrative Science Quarterly 37(3): 422-447.

This paper argues that two network mechanisms operate to create and reinforce gender inequalities in the organizational distribution of power: sex differences in homophily (i.e., tendency to form same-sex network relationships) and in the ability to convert individual attributes and positional resources into network advantages. These arguments were tested in a network analytic study of men's and women's interaction patterns in an advertising firm. Men were more likely to form homophilous ties across multiple networks and to have stronger homophilous ties, while women evidenced a differentiated network pattern in which they obtained social support and friendship from women and instrumental access through network ties to men. Although centrality in organization-wide networks did not vary by sex once controls were instituted, relative to women, men appeared to reap greater network returns from similar individual and positional resources, as well as from homophilous relationships.

Ibarra, H. (1993). "Network centrality, power, and innovation involvement - determinants of technical and administrative roles." Academy of Management Journal **36**(3): 471-501.

The reported research investigated the relative impacts of individual attributes, formal position, and network centrality on the exercise of individual power, measured as involvement in technical and administrative innovations. Centrality was more important for administrative innovation roles, and rank and centrality were indistinguishable in their effects on technical innovation roles. Centrality also appeared to mediate the impact of individual attributes and formal position on administrative innovation roles to a greater extent than it mediated their impact on technical roles. Results suggest that an organization's informal structure may be more critical than its formal structure when the exercise of power requires extensive boundary spanning and that sources of power have both general and innovation-specific effects.

Ibarra, H. (1995). "Race, opportunity, and diversity of social circles in managerial networks." Academy of Management Journal **38**(3): 673-703.

This study investigated the informal networks of white and minority managers. Minority managers had more racially heterogeneous and fewer intimate network relationships. Within the minority group, differences in advancement potential were associated with different network configurations: high-potential individuals balanced same- and cross-race contacts; others had networks dominated by ties to whites. High-potential minorities also had more contacts outside their groups, fewer high-status ties, and less overlap between their social and instrumental circles. Relative to whites, minority managers viewed similar network characteristics as providing less access to career benefits.

Ibarra, H. and S. B. Andrews (1993). "Power, social influence, and sense making - effects of network centrality and proximity on employee perceptions." Administrative Science Quarterly **38**(2): 277-303.

This paper explores the hypothesis that network interaction patterns affect employee perceptions through two conceptually and empirically distinguishable mechanisms: localized social influence based on network proximity and systemic power based on network centrality. The study explores the relative contributions of individual attributes, formal organizational positions, network centrality, and network proximity in explaining individual variation in perceptions of work-related conditions in an advertising firm. Results suggest that network factors shape job-related perceptions, over and above the effects of individual attributes and formal positions. Both advice network centrality and friendship network proximity evidenced significant effects, although they were stronger for centrality than for proximity.

James, E. H. (2000). "Race-related differences in promotions and support: Underlying effects of human and social capital." Organization Science **11**(5): 493-508.

This study examined two alternative explanations for disparity in reported work-related experiences and outcomes between black and white managers: treatment discrimination because of race, and differences in human and social capital. Education and training, representing human capital, and racial similarity of network ties and proportion of strong ties, representing social capital, were used to predict whether human and social capital would mediate the relationship between race and the work-related experiences and outcomes under investigation. Results of a survey of black and white managers in a Fortune 500 financial services firm indicate that black managers reported a slower rate of promotion and less psychosocial support than white managers. Race had both a direct and an indirect effect on these outcomes. Participation in company training significantly predicted reported promotion rates, but race remained a significant predictor. Additional analysis revealed that race moderates the relationship between human capital and promotion rate and suggests a type of treatment discrimination against blacks. Contrary to predictions, social capital did not predict promotion rate, although social capital mediated the relationship between race and psychosocial support. Black managers reported having less social capital than whites, and social capital, in turn, was positively related to the receipt of psychosocial support. No differences were found between blacks and whites in their receipt of career-related support.

Jones, C., W. S. Hesterly, et al. (1997). "A general theory of network governance: Exchange conditions and social mechanisms." *Academy of Management Review* 22(4): 911-945.

A phenomenon of the last 20 years has been the rapid rise of the network form of governance. This governance form has received significant scholarly attention but, to date, no comprehensive theory for it has been advanced, and no sufficiently detailed and theoretically consistent definition has appeared. Our objective in this article is to provide a theory that explains under what conditions network governance, rigorously defined, has comparative advantage and is therefore likely to emerge and thrive. Our theory integrates transaction cost economics and social network theories, and, in broad strokes, asserts that the network form of governance is a response to exchange conditions of asset specificity, demand uncertainty, task complexity, and frequency. These exchange conditions drive firms toward structurally embedding their transactions, which enables firms to use social mechanisms for coordinating and safeguarding exchanges. When all of these conditions are in place, the network governance form has advantages over both hierarchy and market solutions in simultaneously adapting, coordinating, and safeguarding exchanges.

Jones, C., W. S. Hesterly, et al. (1998). "Professional service constellations: How strategies and capabilities influence collaborative stability and change." *Organization Science* 9(3): 396-410.

Constellations-alliances among multiple firms-are used to perform complex, customized work in professional service. We examine two tensions inherent in multi-party collaborative work: managing hybrid systems, which are composed of individual and group tasks and outcomes, and aligning partners' logics of action. These two tensions provide firms the strategic choice with emphasizing individual or collective advantage. When constellation members pursue an individualist strategy, they employ an entrepreneurial logic. Constellations are a vehicle for honing their firm-distinctive expertise and enhancing their own opportunities. Given these firms' need for exposure to new learning and new markets from different partners and clients, the stability of the constellation is not of primary importance. This strategy promotes membership shifts in constellations and requires governance mechanisms for coordinating interactions among relative strangers. When constellation members pursue a collectivist strategy, they focus on their mutual benefits and employ a relational logic. Given these firms' need for intensifying relations with partners and clients, constellation members restrict interactions to certain select partners and clients and intensify their interactions. This strategy promotes stability in constellation membership and allows governance mechanisms specific to partners to develop. Due to positive feedback, these strategies develop certain capabilities and create specific relational patterns, which reinforce prior choices.

Katz, N. and D. Lazer (2002). *Designing effective teams: Team performance and information flows within and among teams*. Cambridge.

Our work integrates two largely independent areas of research: teams and networks. Each of these research streams has produced important insights that can help managers get more out of their people and organizations. Little scholarly work, though, has brought the team and network perspectives together. Team experts have repeatedly called for research that bridges internal and external views of the team - that is, research that analyzes the internal dynamics among teammates, the team's links to outsiders, and the interplay between the team's internal and external relationships. We believe the network literature provides a useful - and underutilized - methodology for understanding a team's internal and external dynamics and their inter-relationship. We draw upon network methodology to examine how prior ties within a team (internal social capital) and a team's links to the broader organizational structure (external social capital) influence team functioning, and, in turn, team performance. Such integrative research is particularly timely in light of the fact that increasing numbers of organizations are using teams to accomplish mission-critical tasks, and many of those same organizations are adopting network rather than hierarchical structures.

Katz, N. and D. Lazer (2003). *Building effective intra-organizational networks: The role of teams*.

The objective of this paper is to bring together the largely independent literatures of networks and teams. Our objective is twofold: (1) to understand what constitutes an effective organizational network when much of the work of the organization is done by teams; and (2) to examine what the internal and external social capital needs of teams are. We raise questions to guide future research, and point to potential managerial implications.

Keister, L. A. (2001). "Exchange structures in transition: Lending and trade relations in Chinese business groups." *American Sociological Review* **66**(3): 336-360.

The networks of interfirm relations that developed in business groups during economic transition are central to China's reform and are becoming an important part of the country's emergent economic structure. Using a recent and original data set that includes direct observations of economic choices made by firms, the process by which these interfirm lending and trade ties emerged and evolved in the early stages of reform is explored. Initially, information from sources external to the network dominated the formation and direction of exchange relations. Firms turned to their prior connections, look advantage of market position, and drew on bureaucratic power to develop alliances. Over time, internal influences gained importance, and managers increasingly drew on internal nontrade relations and other indicators inside the business group to identify lending and trade partners. The results demonstrate the central but changing role that social relations and environmental cues played in the creation of economic structure during China's transition. This study also contributes to an understanding of the processes of organizational adaptation to a major economic transition and interfirm alliance formation more generally. The findings reveal that firms select exchange partners of known reputation and solicit relations that reduce uncertainty, even when there is a cost involved.

Kettinger, W. J. and V. Grover (1997). "The use of computer-mediated communication in an interorganizational context." *Decision Sciences* **28**(3): 513-555.

The rapid growth of global telecommunication networks, and in particular the Internet, has placed emphasis on electronic mail's potential as an interorganizational communication medium allowing people from different organizations to communicate, gather information, form teams, and pass knowledge across time and place. An important area of research is to understand those factors affecting interorganizational computer-mediated communication usage decisions. This study examines how interorganizational electronic mail (email) systems are being used and what factors relate to this use. This was accomplished by electronically surveying a randomly selected sample of interorganizational email users. The 613 Internet-based respondents were located in 20 different countries and were from education, business, and government. This research examines the characteristics of interorganizational email users, their perceptions of task and channel attributes, and the relationship between these characteristics and interorganizational email use. Three empirically derived patterns of interorganizational email use emerged that showed it was regularly used for broadcast task, and social communication. Broadcast usage, which reflects an information gathering communication function, most likely through public bulletin boards, electronic discussion groups, and list servers, was the most frequent use of interorganizational email. Multivariate regression tests showed that the three different usage types were best predicted from different sets of independent variables. Results support past claims that there is a need to differentiate among types of use in explaining computer-mediated communication usage behavior. Implications and recommendations for both researchers and practitioners are drawn from the results.

Kilduff, M. and D. Krackhardt (1994). "Bringing the Individual Back in - a Structural-Analysis of the Internal Market for Reputation in Organizations." *Academy of Management Journal* **37**(1): 87-108.

We challenge the claimed incommensurability of individualism and structuralism by showing how a cognitive theory can guide the use of structural methods. According to balance theory, there is a strain toward cognitive balance in observers' perceptions of friendship relations. Thus, we found, as predicted, that being perceived to have a prominent friend in an organization boosted an individual's reputation as a good performer, but that actually having such a friend (as assessed by

conventional structural methods] had no effect. Bringing individual perceptions back into structural analysis enhances, rather than detracts from, the effectiveness of a structural approach.

Kim, H. J. and P. S. Bearman (1997). "The structure and dynamics of movement participation." American Sociological Review 62(1): 70-93.

We develop a dynamic network model of collective action that explains how collective action can arise in the absence of selective incentives or disincentives from the voluntary action of rational actors in large groups. We show that the search for balance in social interaction among interdependent actors can yield a cascade of activism and result in a successful social movement. The characteristics of actors critical for movement success are identified. We also explore the structural conditions underlying a successful cascade of activism and thus identify the social dynamics of and the structural conditions for collective action in human society.

Kogut, B. and U. Zander (1992). "Knowledge of the firm, combinative capabilities, and the replication of technology." Organization Science 3(3): 383-397.

How should we understand why firms exist? A prevailing view has been that they serve to keep in check the transaction costs arising from the self-interested motivations of individuals. We develop in this article the argument that what firms do better than markets is the sharing and transfer of the knowledge of individuals and groups within an organization. This knowledge consists of information (e.g., who knows what) and of know-how (e.g., how to organize a research team). What is central to our argument is that knowledge is held by individuals, but is also expressed in regularities by which members cooperate in a social community (i.e., group, organization, or network). If knowledge is only held at the individual level, then firms could change simply by employee turnover. Because we know that hiring new workers is not equivalent to changing the skills of a firm, an analysis of what firms can do must understand knowledge as embedded in the organizing principles by which people cooperate within organizations.

Based on this discussion, a paradox is identified: efforts by a firm to grow by the replication of its technology enhances the potential for imitation. By considering how firms can deter imitation by innovation, we develop a more dynamic view of how firms create new knowledge. We build up this dynamic perspective by suggesting that firms learn new skills by recombining their current capabilities. Because new ways of cooperating cannot be easily acquired, growth occurs by building on the social relationships that currently exist in a firm. What a firm has done before tends to predict what it can do in the future. In this sense, the cumulative knowledge of the firm provides options to expand in new but uncertain markets in the future.

We discuss at length the example of the make/buy decision and propose several testable hypotheses regarding the boundaries of the firm, without appealing to the notion of "opportunism."

Kogut, B. and U. Zander (1996). "What firms do? Coordination, identity, and learning." Organization Science 7(5): 502-518.

Firms are organizations that represent social knowledge of coordination and learning. But why should their boundaries demarcate quantitative shifts in the knowledge and capability of their members? Should not knowledge reside also in a network of interacting firms? This line of questioning presents the challenge to state an alternative view to the "theory of the firm," a theory that has moved from Cease's early treatment of what firms do to a concern with ownership, incentives, and self-interest. We return to Cease's original insight in understanding the cost and benefits of a firm but based on a view that individuals are characterized by an "unsocial sociality." Does the perception of opportunism generate the need to integrate market transactions into the firm, or do boundaries of the firm lead to the attribution of opportunism? This basic dichotomy between self-interest and the longing to belong is the behavioral underpinning to the superiority of firms over markets in resolving a fundamental dilemma: productivity grows with the division of labor but specialization increases the costs of communication and coordination. The knowledge of the firm has an economic value over market transactions when identity leads to social knowledge that supports coordination and communication. Through identification, procedural rules are learned, and coordination and communication are facilitated across individuals and groups of

diverse specialized competence. A firm is distinct from a market because coordination, communication, and learning are situated not only physically in locality, but also mentally in an identity. Since identity implies a moral order as well as rules of exclusion, there are limitations and costs to relying upon a firm for exchange as opposed to the market. These costs are not necessarily those traditionally assigned to the category of decreasing returns to hierarchy. For example, an identity implies that some practices, and business, may be notionally inconsistent with each other. Norms of procedural justice that are identified with a firm imply that not all technically feasible complements are permissible within the logic of a shared identity. There is consequently a cost to an identity that offsets the benefits. Because the assemblage of elements that compose an organization are subject to requirements of consistency, identities rule out potentially interesting avenues of innovation and creativity. We illustrate these ideas by returning to the original prisoners' dilemma game and by an analysis of the coherence of a firm as a search for complements that are consistent with norms of procedural justice. We argue that the underlying dynamic of a prisoners' dilemma game reveals the problems of coordination, communication, and conflicts in norms of justice when players are deprived of social knowledge and shared identity. Similarly, the determination of a firm's coherence arises out of the demand for a moral and notional consistency in the "categorization" of its activities, as opposed to a technological necessity. These ideas are illustrated through an empirical examination of logical complements in high performance work systems.

Kohler, H. P. (1997). "Learning in social networks and contraceptive choice." *Demography* **34**(3): 369-383.

A puzzling observation in the diffusion of modern fertility control is the persistent diversity in contraceptive practices across communities or social strata. I propose a model of "learning in social networks" to explain this diversity with the random dynamics of word-of-mouth communication. Women are uncertain about the merits of modern contraception and estimate the different qualities of available methods based on imprecise information from network partners. Their contraceptive choices are determined by this estimate and by private knowledge about one's personal characteristics. This process of social learning leads to path-dependent adoption of fertility control within, and diversity in contraceptive practices across villages or social strata.

Kohler, H. P., J. R. Behrman, et al. (2001). "The density of social networks and fertility decisions: Evidence from South Nyanza District, Kenya." *Demography* **38**(1): 43-58.

Demographers have argued increasingly that social interaction is an important mechanism for understanding fertility behavior. Yet it is still quite uncertain whether social learning or social influence is the dominant mechanism through which social networks affect individuals' contraceptive decisions. In this paper we argue that these mechanisms can be distinguished by analyzing the density of the social network and its interaction with the proportion of contraceptive users among network partners. Our analyses indicate that social learning is most relevant with high market activity; in regions with only modest market activity however, social influence is the dominant means by which social networks affect women's contraceptive use.

Kraatz, M. S. (1998). "Learning by association? Interorganizational networks and adaptation to environmental change." *Academy of Management Journal* **41**(6): 621-643.

A study of 230 private colleges over 16 turbulent years supports two arguments: (1) Strong ties to other organizations mitigate uncertainty and promote adaptation by increasing communication and information sharing. (2) Networks can promote social learning of adaptive responses, rather than other, less productive, forms of interorganizational imitation. Colleges that were members of smaller, older, and more homogeneous intercollegiate consortia were more likely to undertake fundamental curriculum changes. Colleges tended to imitate similar consortium partners that were performing well rather than larger and more prestigious partners. Implications for organizational adaptation and the growing network perspective within organization theory are considered.

Krackhardt, D. (1987). "Qap Partialling as a Test of Spuriousness." *Social Networks* **9**(2): 171-186.

Krackhardt, D. and M. Kilduff (1999). "Whether close or far: Social distance effects on perceived balance in friendship networks." Journal of Personality and Social Psychology **76**(5): 770-782.

Under what circumstances are individuals' perceptions of friendship relations shaped by the balance schema? Using data from 4 organizations varying in size from 21 to 33 members, the authors investigated how ego's perception of the social distance from ego to alter affected the proportion of alter's friendships perceived by ego as balanced. Balance involves both (a) reciprocated friendships between 2 people, and (b) transitive triplets, in which 2 friends of a person are themselves friends. Graphical and regression analyses supported a composite curvilinear model that combined the predictions of emotional tension and cognitive miser perspectives: People tended to perceive relations close to and distant from themselves as more balanced than relations of intermediate distance.

Kraut, R. E., R. E. Rice, et al. (1998). "Varieties of social influence: The role of utility and norms in the success of a new communication medium." Organization Science **9**(4): 437-453.

This natural experiment investigates the introduction and use of a pair of competing video telephone systems in a company over a period of 18 months. Both quantitative, time-series analyses and in-depth interviews demonstrate that employees adopted and used the video systems for both utility and normative reasons. Consistent with utility explanations, people in the most communication-intensive jobs were the most likely to use video telephony. Consistent with social influence explanations, people used a particular system more when more people in general were using it and when more people in their work group were using it. There were two conceptually distinct, but empirically entangled, types of social influence. First, use by other people changed the objective benefits and costs associated with using the systems, and thus their utility. Second, use by others changed the normative environment surrounding the new technology. Both utility and normative influences were stronger in one's primary work group. Implementers, users, and researchers should consider both utility and normative factors influencing both the success and failure of new organizational communication systems.

Kumbar, E., A. K. Romney, et al. (1994). "Systematic Biases in Social-Perception." American Journal of Sociology **100**(2): 477-505.

Members of a professional group reported on friendship ties among all members, including themselves. Multiple methods of analysis reveal several systematic biases. In spatial representations individuals' self-perceived positions are closer to the centroid than their group-perceived positions. Graph-theoretic centrality measures show that group members tend to have highest centrality in their own digraphs, and they tend to report more ties, more reciprocated ties, and more transitive triples among those they report, as opposed to those they do not report, as friends. Despite these individual biases, correspondence analysis provides a valid group-level representation of the friendship network.

Labianca, G., D. J. Brass, et al. (1998). "Social networks and perceptions of intergroup conflict: The role of negative relationships and third parties." Academy of Management Journal **41**(1): 55-67.

This study investigated the relationship between interpersonal relationships among members of different departments and individuals' perceptions of intergroup conflict within an organization. Although friendships across groups were not significantly related to perceptions of intergroup conflict, negative relationships were associated with higher perceived intergroup conflict. Perceptions of intergroup conflict were also significantly related to indirect relationships through friends, and an amplification effect was uncovered. Finally, low intragroup cohesiveness was significantly related to higher perceptions of intergroup conflict.

Laopodis, V. (1994). Tais - Technology-Assessment Information-System. Information Processing '94, Vol Iii. **53**: 235-240.

Technology Assessment methods and practices are applicable to any technological sector and therefore constitute a valuable instrument in order to bridge the gap between the technological potential and the social and economic needs and wishes from these technologies. This

consideration is by excellence applicable to Information and Communication Technologies (ICT) and allowed the development of a special field of Technology Assessment : Information Technology Assessment). This paper discusses initially the TA concept from the viewpoint of the European Commission Research and Technological Development (RTD) programmes and presents some recent initiatives of the EC VALUE II programme and more particularly its interface between research and society. Finally it discusses the idea of a "Technology Assessment Information System - T A I S" at European and international level. This information system will allow a harmonisation of TA activities by providing a number of functions such as: information exchange function (TA database, networking support, newsletter, etc.), clearing house function (mainly information brokerage) and finally diffusion function (development of courseware and training schemes).

Larson, A. (1992). "Network Dyads in Entrepreneurial Settings - a Study of the Governance of Exchange Relationships." Administrative Science Quarterly **37**(1): 76-104.

Social control in network organizational forms is examined through an inductive field study of a sample of dyadic relationships established by high-growth entrepreneurial firms. The social dimensions of the transactions are central in explaining control and coordination in the exchange structures. A process model of network formation is presented that highlights the importance of reputation, trust, reciprocity, and mutual interdependence. The network form is proposed as an alternative to vertical integration for high-growth entrepreneurial firms. The data also suggest that studying the network form of governance can provide insights into firm growth.

Lawler, E. J., S. R. Thye, et al. (2000). "Emotion and group cohesion in productive exchange." American Journal of Sociology **106**(3): 616-657.

This study refines and experimentally tests a theory of relational cohesion that explains how and when actors become committed to one another in the context of multiactor exchange. The theory asserts that frequent social exchange results in (1) positive emotions that solidify and strengthen the person-to- group bond and (2) uncertainty reduction that renders the focal group more salient in relation to others. These two mechanisms produce a sense of psychological group formation and ultimately increase observable acts of commitment. In a "productive exchange" setting, three actors negotiate a joint venture that requires the assent of all members. The exchanges featured two forms of commitment behavior: the giving of small token gifts and the decision to invest in a three-way prisoner's dilemma. The results suggest that positive emotion and uncertainty reduction are theoretically distinct and affect commitment behavior through different mechanisms. The article concludes by discussing the general implications for commitment and social order.

Lawler, E. J. and J. Yoon (1998). "Network structure and emotion in exchange relations." American Sociological Review **63**(6): 871-894.

Network structures promote cohesive social relations among some actors and not others. Based on the theory of relational cohesion (Lawler and Yoon 1996), we hypothesize that an emotional/affective process explains how and when network structures produce such effects. The main ideas are: (1) If a network produces differential exchange frequencies among component dyads then, ceteris paribus, that network will tend to produce different degrees of internal cohesion within those dyads and will do so through the positive emotions or feelings generated by successful exchanges. (2) This effect should be more evident in equal than in unequal-power relations, and it should be weaker when network members share an overarching group identity. We conduct an experiment to test these hypotheses. The results indicate: Dyadic cohesion develops through an emotional/affective process in equal-power relations, as hypothesized, but not in unequal-power relations; and an overarching group identity reduces the degree that central actors exploit peripheral ones but does not impact dyad-level cohesion. The larger implication is that in networks containing both equal and unequal-power relations, internal pockets of cohesion are more likely to emerge in the former because of the mild, everyday positive feelings produced by successful exchanges.

Lazer, D. M. (2001). "The co-evolution of individual and network." Journal of Mathematical Sociology 25(1): 69-108.

Individuals simultaneously choose and are affected by their web of connections. This paper explores this co-evolution of individual and network in the context of longitudinal attitudinal and sociometric data collected from a government agency, the Office of Information and Regulatory Affairs. Analysis of these data suggests that networks vary in their elasticity - where the internal network of the agency was rigid, but the extra-organizational network quite fluid. Further, the data suggest that, consistent with theories of socialization, individuals differ in plasticity - how they are affected by the network - where the cross-sectional analysis of the data suggest that individuals were molded by the organization, but that the attitudes of individuals who left were unaffected by the change in milieu.

Lazer, D. M. and N. Katz (2000). Putting the Network into Teamwork. KSG Working Paper. Cambridge, MA.

This paper explores how ties within and across teams shape both the internal processes of a team and a team's access to critical outside resources. We then apply these ideas in a field setting, testing the hypotheses that prior ties among teammates (internal social capital) help teams overcome the free-rider and coordination problems that often bedevil teams, and that ties to the outside social system (external social capital) provide a team with additional resources to draw on. We find that at the team level of analysis, density of intra- and extra-team ties are poor predictors of team functioning or team performance. At the individual level, however, the picture is more complex. The connectedness of an individual to his/her team is strongly and positively related to that individual's perception of team functioning when the rest of the members of the team are not connected to one another. However, the connectedness of an individual to his/her team is strongly and negatively related to that individual's perception of team functioning when the rest of the members of the team are highly connected to one another. Similarly, the degree to which the rest of the members of the team are highly connected to one another is positively related to an individual's perception of team functioning when said individual is not well connected to the team, and negatively when s/he is well connected. This suggests a "too many chefs" problem in intra-team networks: everyone sees the need for some ties to coordinate team action; everyone feels the team functions best if they themselves fill this function exclusively (that is, if they are the hub and the other members of the team are mere spokes); and the worst possible scenario is to have too many people fill this function (everyone is trying to be the hub).

Lee, C., K. Lee, et al. (2001). "Internal capabilities, external networks, and performance: A study on technology-based ventures." Strategic Management Journal 22(6-7): 615-640.

This study examined the influence of internal capabilities and external networks on firm performance by using data from 137 Korean technological start-up companies. Internal capabilities were operationalized by entrepreneurial orientation, technological capabilities, and financial resources invested during the development period. External networks were captured by partnership- and sponsorship-based linkages. Partnership-based linkages were measured by strategic alliances with other enterprises and venture capitalists, collaboration with universities or research institutes, and participation in venture associations. Sponsorship-based linkages consisted of financial and nonfinancial support from commercial banks and the Korean government. Sales growth indicated the start-up's performance. Regression results showed that the three indicators of internal capabilities are important predictors of a start-up's performance. Among external networks, only the linkages to venture capital companies predicted the start-up's performance. Several interaction terms between internal capabilities and partnership-based linkages have a statistically significant influence on performance. Sponsorship-based linkages do not have individual effects on performance but linkage with financial institutions has a multiplicative effect with technological capabilities and financial resources invested on a start-up's performance. implications and directions for future research were discussed.

Li, X. J. (2002). "The changing spatial networks of large state-owned enterprises in reform-era China: A company case study." *Tijdschrift Voor Economische En Sociale Geografie* **93**(4): 383-396.

In the past two decades China's transition from a planned economy to a market-oriented economy with enterprise reform - targeting an increase of enterprise autonomy and improvement of productive efficiency - has resulted in many changes in spatial networks of large state-owned enterprises. Detailed data from interviews with China's largest agricultural machinery company, China First Tractor Group Corporation Ltd, reveal that the density of networks was being strengthened. Except in sales and material supply, networks in management, technology and other types of material linkages were spatially expanding. Behind these changes were many political and economical factors. Personal relationships or *guanxi* only played a secondary role. State-owned enterprises (SOEs) in China experienced different mechanisms from the chaebols in South Korean and Chinese business in other Asian countries in networks formation and evolution. While the changing patterns of spatial networks in general favoured SOEs, their negative effect of shrinking the market area cannot be ignored.

Lin, N. (1999). "Social networks and status attainment." *Annual Review of Sociology* **25**: 467-487.

This essay traces the development of the research enterprise, known as the social resources theory, which formulated and tested a number of propositions concerning the relationships between embedded resources in social networks and socioeconomic attainment. This enterprise, seen in the light of social capital, has accumulated a substantial body of research literature and supported the proposition that social capital, in terms of both access and mobilization of embedded resources, enhances the chances of attaining better statuses. Further, social capital is contingent on initial positions in the social hierarchies as well as on extensity of social ties. The essay concludes with a discussion of remaining critical issues and future research directions for this research enterprise.

Lorrain, F. and H. White (1971). "Structural equivalence of individuals in social networks." *Journal of Mathematical Sociology* **1**(1): 49-80.

Marsden, P. V. (1988). "Homogeneity in Confiding Relations." *Social Networks* **10**(1): 57-76.

McKelvey, B. (1999). "Avoiding complexity catastrophe in coevolutionary pockets: Strategies for rugged landscapes." *Organization Science* **10**(3): 294-321.

Can firms and coevolutionary groups suffer from too much interdependent complexity? Is complexity theory an alternative explanation to competitive selection for the emergent order apparent in coevolutionary industry groups? The biologist Stewart Kauffman suggests a theory of complexity catastrophe offering universal principles explaining phenomena normally attributed to Darwinian natural selection theory. Kauffman's complexity theory seems to apply equally well to firms in coevolutionary pockets. Based on complexity theory, four kinds of complexity are identified. Kauffman's "NK[C] model" is positioned "at the edge of chaos" between complexity driven by "Newtonian" simple rules and rule-driven deterministic chaos. Kauffman's insight, which is the basis of the findings in this paper, is that complexity is both a consequence and a cause. Multicoevolutionary complexity in firms is defined by moving natural selection processes inside firms and down to a "parts" level of analysis, in this instance Porter's value chain level, to focus on microstate activities by agents. The assumptions of stochastically idiosyncratic microstates and coevolution in firms are analyzed. Competitive advantage, as a dependent variable, is defined in terms of Nash equilibrium fitness levels. This allows a translation of Kauffman's theory to firms, paying particular attention to (1) how value chain landscapes might be modeled, (2) assumptions underlying Kauffman's models making them amenable to firms, and (3) a delineation of seven of Kauffman's computational experiments. As part of the translation, possible parallels between the application of complexity catastrophe theory to coevolutionary pockets and studies by institutional theorists and social network analysts are discussed. The models derive from spin- glass microstate models resulting in Boolean games. Kauffman's Boolean statistical mechanics is introduced in developing the logic underlying the somewhat simplified NK[C] model. The model allows the use of computational experiments to better

understand how the dependent variable-value chain fitness-is affected by changes in the number of internal interdependencies K , the number of coevolutionary links with opponents C , the size of the coevolutionary pocket S , and the number of simultaneous adaptive changes, among other things. Various computational experiments are presented that suggest strategic organizing approaches most likely to foster competitive advantage. High or low Nash equilibrium fitness levels are shown to result from internal and external coevolutionary densities as a function of links among value chain competencies within a firm and between a firm and an opponent. Complexity phenomena appear to suggest a number of expected (and thus validating) and surprising strategies with respect to complex organizational interdependencies. For example, moderate complexity fares best and external coevolutionary complexity sets an upper bound to advantages likely to be gained from internal complexity. Various complexity "lessons" are discussed. Models such as the $NK[C]$ could offer insights into strategic organizing.

McPherson, J. M., P. A. Popielarz, et al. (1992). "Social networks and organizational dynamics." *American Sociological Review* **57**(2): 153-170.

In this paper we develop and test a theory of the dynamic behavior of voluntary groups. The theory combines an image of social network structure with the concept of natural selection to model changes in group composition over time. We consider the group to be a population of members subject to natural selection in sociodemographic space. According to the theory, the probability that members will enter or leave the group depends upon the number and strength of social network ties that connect group members to each other and to nonmembers. We analyze an event history dataset constructed from interviews using Life History Calendar method and information on ego-centered social networks developed from the General Social Survey Network Module. We test the hypothesis that network connections inside a group are associated with reduced membership turnover, while connections outside the group increase turnover. We find that weak ties and network connections that span greater distances in sociodemographic space are positively correlated with leaving current groups and joining new ones. We conclude that weak ties are a major source of change in group composition.

McPherson, J. M. and T. Rotolo (1996). "Testing a dynamic model of social composition: Diversity and change in voluntary groups." *American Sociological Review* **61**(2): 179-202.

We test a dynamic model of the social composition of voluntary groups. The model is based on the idea that sociodemographic variables define social niches in which voluntary groups grow and decline, share and compete, and change or remain static. The flow of individuals through such groups depends on the competition of other groups for their time and other resources. We build a dynamic model of this process and show how this model can account for changes in the social composition and the social heterogeneity of voluntary groups. We use life history data on the group affiliations of 1,050 individuals from 1974 to 1989 to test hypotheses about the diversity of education among group members and about the mean level of education of the members. Our data strongly support the hypotheses.

McPherson, M., L. Smith-Lovin, et al. (2001). "Birds of a feather: Homophily in social networks." *Annual Review of Sociology* **27**: 415-444.

Similarity breeds connection. This principle—the homophily principle—structures network ties of every type, including marriage, friendship, work, advice, support, information transfer, exchange, comembership, and other types of relationship. The result is that people's personal networks are homogeneous with regard to many sociodemographic, behavioral, and intrapersonal characteristics. Homophily limits people's social worlds in a way that has powerful implications for the information they receive, the attitudes they form, and the interactions they experience. Homophily in race and ethnicity creates the strongest divides in our personal environments, with age, religion, education, occupation, and gender following in roughly that order. Geographic propinquity, families, organizations, and isomorphic positions in social systems all create contexts in which homophilous relations form. Ties between nonsimilar individuals also dissolve at a higher rate, which sets the stage for the formation of niches (localized positions) within social

space. We argue for more research on: (a) the basic ecological processes that link organizations, associations, cultural communities, social movements, and many other social forms; (b) the impact of multiplex ties on the patterns of homophily; and (c) the dynamics of network change over time through which networks and other social entities co-evolve.

Mehra, A., M. Kilduff, et al. (1998). "At the margins: A distinctiveness approach to the social identity and social networks of underrepresented groups." *Academy of Management Journal* **41**(4): 441-452.

Using distinctiveness theory, this research showed that the relative rarity of a group in a social context tended to promote members' use of that group as a basis for shared identity and social interaction. Relative to majority group members, racial minorities and women in a master of business administration cohort were more likely to make identity and friendship choices within-group. The marginalization of racial minorities in the friendship network resulted both from exclusionary pressures and from minority individuals' own preferences for same-race friends. By contrast, the marginalization of women resulted more from exclusionary pressures than from their preferences for woman friends.

Mehra, A., M. Kilduff, et al. (2001). "The social networks of high and low self-monitors: Implications for workplace performance." *Administrative Science Quarterly* **46**(1): 121-146.

This article examines how different personality types create and benefit from social networks in organizations. Using data from a 116-member high-technology firm, we tested how self-monitoring orientation and network position related to work performance. First, chameleon-like high self-monitors were more likely than true-to-themselves low self-monitors to occupy central positions in social networks. Second, for high (but not for low) self-monitors, longer service in the organization related to the occupancy of strategically advantageous network positions. Third, self-monitoring and centrality in social networks independently predicted individuals' workplace performance. The results paint a picture of people shaping the networks that constrain and enable performance.

Mizruchi, M. S. (1996). "What do interlocks do? An analysis, critique, and assessment of research on interlocking directorates." *Annual Review of Sociology* **22**: 271-298.

Research on interlocking directorates has gained increasing prominence within the field of organizations, but it has come under increasing criticism as well. This chapter presents an in-depth examination of the study of interlocking directorates. I focus initially on both the determinants and the consequences of interlocking directorates, reviewing alternative accounts of both phenomena. Special attention is paid to the processual formulations implied by various interlock analyses. I then address the two primary criticisms of interlock research and evaluate the tenability of these criticisms. I conclude with a discussion of future directions for interlock research.

Mizruchi, M. S. and L. C. Fein (1999). "The social construction of organizational knowledge: A study of the uses of coercive, mimetic, and normative isomorphism." *Administrative Science Quarterly* **44**(4): 653-683.

Arguing that knowledge in the social sciences is socially constructed through the selective interpretation of major works, we examine the fate of a classic article in organizational theory, DiMaggio and Powell's 1983 essay on institutional isomorphism. We show that one aspect of this article, the discussion of mimetic isomorphism, has received attention disproportionate to its role in the essay. A detailed examination of 26 articles in which researchers attempted to operationalize various components of DiMaggio and Powell's model shows that measures used to capture one of their concepts could have served as valid measures of one of the others. Findings show that DiMaggio and Powell's thesis has become socially constructed, as authors have selectively appropriated aspects of the work that accord with prevalent discourse in the field, and that centrally located researchers in sociology and organizational behavior are more likely than other scholars to invoke this dominant interpretation of their article.

Monge, P. R. and N. Contractor (2003). Theories of Communication Networks. New York, Oxford University Press.

(review from oxford press)

To date, most network research contains one or more of five major problems. First, it tends to be atheoretical, ignoring the various social theories that contain network implications. Second, it explores single levels of analysis rather than the multiple levels out of which most networks are comprised. Third, network analysis has employed very little the insights from contemporary complex systems analysis and computer simulations. Fourth, it typically uses descriptive rather than inferential statistics, thus robbing it of the ability to make claims about the larger universe of networks. Finally, almost all the research is static and cross-sectional rather than dynamic. Theories of Communication Networks presents solutions to all five problems. The authors develop a multitheoretical model that relates different social science theories with different network properties. This model is multilevel, providing a network decomposition that applies the various social theories to all network levels: individuals, dyads, triples, groups, and the entire network. The book then establishes a model from the perspective of complex adaptive systems and demonstrates how to use *Blanche*, an agent-based network computer simulation environment, to generate and test network theories and hypotheses. It presents recent developments in network statistical analysis, the p^* family, which provides a basis for valid multilevel statistical inferences regarding networks. Finally, it shows how to relate communication networks to other networks, thus providing the basis in conjunction with computer simulations to study the emergence of dynamic organizational networks.

Montgomery, J. D. (1994). "Weak Ties, Employment, and Inequality - an Equilibrium-Analysis." American Journal of Sociology **99**(5): 1212-1236.

This article adds a simple social structure and pattern of social interaction to a Markov model of employment transitions. In the model, society is composed of many small (two-person) groups. Unemployed individuals find jobs through strong ties (intragroup social interaction), weak ties (random intergroup interaction), and formal channels. Holding constant the total level of social interaction, the author examines how a change in the composition of social interaction affects the steady-state equilibrium. An increase in weak-tie interactions reduces inequality, thereby creating a more equitable distribution of employment across groups. Moreover, an increase in weak-tie interactions increases the steady-state employment rate if inbreeding by employment status among weak ties is sufficiently low.

Nahapiet, J. and S. Ghoshal (1998). "Social capital, intellectual capital, and the organizational advantage." Academy of Management Review **23**(2): 242-266.

Scholars of the theory of the firm have begun to emphasize the sources and conditions of what has been described as "the organizational advantage," rather than focus on the causes and consequences of market failure. Typically, researchers see such organizational advantage as accruing from the particular capabilities organizations have for creating and sharing knowledge. In this article we seek to contribute to this body of work by developing the following arguments: (1) social capital facilitates the creation of new intellectual capital: (2) organizations, as institutional settings, are conducive to the development of high levels of social capital: and (3) it is because of their more dense social capital that firms, within certain limits, have an advantage over markets in creating and sharing intellectual capital. We present a model that incorporates this overall argument in the form of a series of hypothesized relationships between different dimensions of social capital and the main mechanisms and processes necessary for the creation of intellectual capital.

Nelson, R. E. (1989). "The strength of strong ties: Social networks and intergroup conflict in organizations." Academy of Management Journal **32**(2): 377-401.

Nooteboom, B. (1999). "Innovation and inter-firm linkages: new implications for policy." Research Policy **28**(8): 793-805.

This article discusses the implications for competition, innovation and learning of different forms of inter-firm linkage, ways to govern them, different 'generic systems' of innovation, and government policy. It employs a transformed theory of transactions that can deal with innovation and learning, and brings in trust next to opportunism [Nooteboom, B., 1996a. Trust, opportunism and governance: a process and control model. *Organization Studies* 17 (6) 985-1010; Nooteboom, B., 1996b. Towards a Learning Based Model of Transactions. In: Groenewegen, J. (Ed.), *TCE and Beyond*. Kluwer, Deventer, pp. 327-349; Nooteboom, B., 1999a. *Inter-firm alliances: Analysis and design*. Routledge, London.]. While trust has its limits and should not be blind, it can lower transaction costs. For learning and innovation, it takes the resource/competence perspective, supported by a theory of knowledge developed in earlier publications. According to this theory people perceive, interpret and evaluate the world according to cognitive categories that have developed in interaction with the physical and social environment. As a result people will perceive, understand and evaluate differently to the extent that they have developed in different environments without interaction [Nooteboom, B., 1992,. Towards a dynamic theory of transactions. *Journal of Evolutionary Economics* 2, 281-299; Nooteboom, 1999a.]. This theory yields the notion of 'external economy of cognitive scope': people and firms need outside sources of cognition and competence to complement their own. That is the fundamental reason why inter-firm Linkages are important, especially for innovation. In order to produce high added value and novelty, by utilizing the opportunities of complementary competencies, firms need to make relation- specific investments which creates risks of 'hold-up' and 'spill-over'. Building on earlier work, the article identifies different instruments for the control of those risks [Nooteboom, 1996a; Nooteboom, 1996b; Nooteboom, et al., 1997. Effects of trust and governance on relational risk. *Academy of Management Journal* 40 (2) 308-338; Nooteboom, 1999a.]. It identifies two 'generic' kinds of innovation systems, in terms of the mix of instruments for relational governance, and discusses their merits and flaws with respect to quality of products, diffusion, incremental and radical innovation. One is close to practices in continental Europe and Japan. Another is close to Anglo-American practice. There is a certain tendency for the first to gravitate to the second. The article warns about the dangers involved, and explores a possible 'third way'. (C) 1999 Elsevier Science B.V. All rights reserved.

O'Donnell, S. W. (2000). "Managing foreign subsidiaries: Agents of headquarters, or an interdependent network?" *Strategic Management Journal* 21(5): 525-548.

In this study, two different theoretical perspectives are used to develop sets of hypotheses regarding the mechanisms used to manage foreign subsidiaries of multinational corporations. First, agency theory serves as the basis for a model that predicts the use of monitoring mechanisms and incentive compensation. Then, it is argued that these mechanisms are insufficient for managing subsidiaries characterized by high levels of intra-firm international interdependence, the management of which is critical to many of today's complex global firms. A second set of hypotheses is argued, linking international interdependence to several social control mechanisms. Primary and secondary data from U.S. based multinational corporations were used to test both sets of hypotheses. The results indicate that agency theory, although a useful foundation for studies of control within MNCs, is limited in its ability to explain fully the phenomenon of foreign subsidiary control, however the model based on intra- firm interdependence had much greater predictive ability.

Opp, K. D. and C. Gern (1993). "Dissident Groups, Personal Networks, and Spontaneous Cooperation - the East-German Revolution of 1989." *American Sociological Review* 58(5): 659-680.

We focus on the roles of groups and personal networks in demonstrations in the repressive setting of East Germany between May and October 1989. We first propose a micro-model specifying a broad set of individual incentives to participate; then we contend that political events and changes in the social context together with existing coordinating mechanisms produced the large-scale demonstrations in 1989. Most of our hypotheses are tested using a representative survey of Leipzig's population in the fall of 1990 that focuses on the 1989 protests. Among the incentives, only political discontent, weighted by perceived personal political influence, has a major impact

on participation in the demonstrations. The expectation of repression was irrelevant. Opposition groups were unable to shape the incentives of the population, and incentives for their members to participate were weak, whereas negative incentives prevailed for members of the Socialist Party. Incentives to participate were concentrated in personal networks of friends. Thus, personal networks were the most important contexts for mobilizing citizens. A "spontaneous coordination model" explains how discontented citizens met at particular times and places, and why few incentives were necessary to prompt participation in the demonstrations.

Palmer, D. and B. M. Barber (2001). "Challengers, elites, and owning families: A social class theory of corporate acquisitions in the 1960s." *Administrative Science Quarterly* 46(1): 87-120.

This paper analyzes data on 461 large U.S. industrial corporations to determine the factors that led large firms to participate in the wave of diversifying acquisitions that peaked in the late 1960s. We elaborate and test a class theory of corporate acquisitions, maintaining that firms pursued acquisitions in this period when they were commanded by well-networked challengers who were central in elite social networks but relatively marginal with respect to social status, isolated from the resistance of established elites, and free from control of owning families. We also consider a wide range of factors highlighted by alternative accounts of acquisition likelihood, including resource dependence, institutional pressures, and principal-agent conflicts. The results provide support for our main theoretical arguments, even when controls related to alternative explanations are taken into account.

Park, S. H. and Y. D. Luo (2001). "Guanxi and organizational dynamics: Organizational networking in Chinese firms." *Strategic Management Journal* 22(5): 455-477.

This paper focuses on the utilization of guanxi, which is an important cultural and social element in China, and the impact of guanxi on firm performance. Although guanxi is embedded in every aspect of Chinese social life, companies demonstrate different needs and capacity for guanxi cultivation. Chinese firms develop guanxi as a strategic mechanism to overcome competitive and resource disadvantages by cooperating and exchanging favors with competitive forces and government authorities. We develop an integrative framework theorizing guanxi utilization according to institutional, strategic, and organizational factors, and we explore the impact of guanxi on firm performance, primarily sales growth and net profit growth. Our findings, based on a survey of 128 firms in central China, provide strong support that institutional, strategic and organizational factors are critical determinants of guanxi with competitive forces. However, only institutional and strategic factors are significant for guanxi utilization with government authorities. In general, guanxi leads to higher firm performance, but is limited to increased sales growth, and has little impact on profit growth. Guanxi benefits market expansion and competitive positioning of firms, but does not enhance internal operations.

Pescosolido, B. A. and B. A. Rubin (2000). "The Web of Group Affiliations revisited: Social life, postmodernism, and sociology." *American Sociological Review* 65(1): 52-76.

We address current debates about the future of society and the future of sociology. From Simmel's distinction between social forms in premodern and modern society: we resurrect his original geometric analogy and recast it in current network terms. In this light, we consider various substantive and methodological claims of postmodernists and suggest that their contribution lies in capturing the spirit of rapid social change and the ambiguity that characterizes the present era. The basic problem with the postmodern critique, we argue, lies in its embrace of these characteristics as the new social form- mistaking transition for type. In response, we sketch out a third social form, a "spoke" structure, with accompanying "tensions" and "freedoms" that Simmel recognized as inevitable. Finally, we examine how approaches to two social problems-serious mental illnesses and homelessness-effect and shape the contours of an era's network formation, In particular we discuss how the emergent spoke structure presents challenges to current methodological approaches.

Peteraf, M. A. and M. Shanley (1997). "Getting to know you: A theory of strategic group identity." Strategic Management Journal **18**: 165-186.

This paper develops a theory of strategic group identity that explains how strategic groups emerge in an industry and how they can affect firm behaviors and outcomes. In so doing, it provides a theoretical basis for the existence of strategic groups. We argue that managers cognitively partition their industry environment to reduce uncertainty and to cope with bounded rationality. Social learning theory and social identification theory are used to describe how cognitive groups coalesce into meaningful substructures and how a group-level identity emerges. We describe the ways in which macro level factors condition the development of groups and their identities. We introduce the notion of a strong identity, which characterizes any group sufficiently recognized and attended to by members to affect individual action. Groups with 'weak identities' are no more than transient agglomerations of firms and do not exist in any meaningful sense. These ideas are developed into propositions that describe the conditions under which groups with strong identities are likely to emerge. A second set of propositions describes their transformation over time. Identity strength is linked to both positive and negative outcomes in a final set of propositions. We show how strategic groups with strong identities can affect firm performance resolving a longstanding problem which has plagued strategic groups research and conclude by suggesting some approaches for measurement and future research. (C) 1997 by John Wiley & Sons, Ltd.

Piccio, S. and J. Haines (1999). "Regulating global financial markets." Journal of Law and Society **26**(3): 351-368.

This paper discusses the role of regulation in the emergence of a global system of linked financial markets. It traces the origins of the internationalization of financial markets to the emergence of new competitive pressures, rooted in changes in the social structures of savings and investment, breaking down both national systems of financial control and international arrangements for monetary and financial co-ordination. These changes have been accompanied and facilitated by a process of international re-regulation, through informal specialist networks. Although these have facilitated the international diffusion of regulatory standards and practices, and attempted to co-ordinate them, they are greatly hampered by espousing the perspectives of the various markets and firms which it is their task to supervise. Together with their minimalist view of the aims of public legitimation and oversight of financial markets, they have proved inadequate to prevent the destabilizing effects of the new global finance on the world economy.

Podolny, J. M. and J. N. Baron (1997). "Resources and relationships: Social networks and mobility in the workplace." American Sociological Review **62**(5): 673-693.

We examine how the structure and content of individuals' networks in the workplace affect intraorganizational mobility. Consistent with prior research, we find that an individual's mobility is enhanced by having a large, sparse network of informal ties for acquiring information and resources. However in contrast to previous work, we emphasize the importance of consistent role expectations for performance and mobility. We find evidence that well-defined performance expectations are more likely to arise from a small, dense network of individuals. We develop a typology of network contents and document the interaction between network structure and content in analyses of mobility among employees of a high-technology firm. We also examine how the effects of tie duration on mobility vary by tie content. We discuss the implications of our results for theory and research on networks and organizational mobility.

Podolny, J. M. and K. L. Page (1998). "Network forms of organization." Annual Review of Sociology **24**: 57-76.

Initial sociological interest in network forms of organization was motivated in part by a critique of economic views of organization. Sociologists sought to highlight the prevalence and functionality of organizational forms that could not be classified as markets or hierarchies. As a result of this work, we now know that network forms of organization foster learning, represent a mechanism for the attainment of status or legitimacy, provide a variety of economic benefits, facilitate the management of resource dependencies, and provide considerable autonomy for employees.

However, as sociologists move away from critiquing what are now somewhat outdated economic views, they need to balance the exclusive focus on prevalence and functionality with attention to constraint and dysfunctionality. The authors review work that has laid a foundation for this broader focus and suggest analytical concerns that should guide this literature as it moves forward.

Popielarz, P. A. and J. M. McPherson (1995). "On the Edge or in between - Niche Position, Niche Overlap, and the Duration of Voluntary Association Memberships." *American Journal of Sociology* **101**(3): 698-720.

This paper aims to explain a major barrier to societal integration: the remarkable homogeneity of voluntary associations. The explanation derives from an ecological theory of voluntary affiliation that asserts that organizations compete for members in a property space defined by the sociodemographic characteristics of members. Voluntary organizations lose fastest those members who are either atypical of the group (the niche edge hypothesis) or subject to competition from other groups (the niche overlap hypothesis). The authors analyze an event-history data set, generated by the life-history calendar approach, of 2,813 voluntary association membership spells. The results, which strongly support both the niche edge and niche overlap hypotheses, substantiate the competitive ecological model of group structure.

Porac, J. F., H. Thomas, et al. (1995). "Rivalry and the Industry Model of Scottish Knitwear Producers." *Administrative Science Quarterly* **40**(2): 203-227.

In this paper we argue that market boundaries are socially constructed around a collective cognitive model that summarizes typical organizational forms within an industry. This model is produced when firms observe each other's actions and define unique product positions in relation to each other. Our study examines the question of how firms define a reference group of rivals when market cues are ambiguous and interorganizational variety is high and identifies the industry model underlying rivalry among Scottish knitwear producers. The data suggest that a six-category model of organizational forms best describes the common sense of competition in the industry and that an ensemble of attributes involving size, technology, product style, and geographic location forms the foundation for this ordering. The results also show how this industry model is reproduced within the rivalry network structuring imperfect competition in the industry.

Portes, A. (1998). "Social Capital: Its origins and applications in modern sociology." *Annual Review of Sociology* **24**: 1-24.

This paper reviews the origins and definitions of social capital in the writings of Bourdieu, Loury, and Coleman, among other authors. It distinguishes four sources of social capital and examines their dynamics. Applications of the concept in the sociological literature emphasize its role in social control, in family support, and in benefits mediated by extrafamilial networks. I provide examples of each of these positive functions. Negative consequences of the same processes also deserve attention for a balanced picture of the forces at play. I review four such consequences and illustrate them with relevant examples. Recent writings on social capital have extended the concept from an individual asset to a feature of communities and even nations. The final sections describe this conceptual stretch and examine its limitations. I argue that, as shorthand for the positive consequences of sociability, social capital has a definite place in sociological theory. However, excessive extensions of the concept may jeopardize its heuristic value.

Pratt, M. G. (2000). "The good, the bad, and the ambivalent: Managing identification among Amway distributors." *Administrative Science Quarterly* **45**(3): 456-493.

An ethnographic study of distributors for Amway, a network marketing organization, examines the practices and processes involved in managing members' organizational identification. It shows that this organization manages identification by using two types of practices: sense-breaking practices that break down meaning and sense-giving practices that provide meaning. When both sense-breaking and sense-giving practices are successful, members positively identify with the organization. When either sense-breaking or sense-giving practices fail, members deidentify,

disidentify, or experience ambivalent identification with the organization. A general model of identification management is posited, and implications for both theory and practice are offered.

Provan, K. G. and H. B. Milward (1995). "A preliminary theory of interorganizational network effectiveness - a comparative study of 4 community mental health systems." Administrative Science Quarterly **40**(1): 1-33.

This paper presents the results of a comparative study of interorganizational networks, or systems, of mental health delivery in four U.S. cities, leading to a preliminary theory of network effectiveness. Extensive data were collected from surveys, interviews, documents, and observations. Network effectiveness was assessed by collecting and aggregating data on outcomes from samples of clients, their families, and their case managers at each site. Results of analyses of both quantitative and qualitative data collected at the individual, organizational, and network levels of analysis showed that network effectiveness could be explained by various structural and contextual factors, specifically, network integration, external control, system stability, and environmental resource munificence. Based on the findings, we develop testable propositions to guide theory development and future research on network effectiveness.

Rangan, S. (2000). "The problem of search and deliberation in economic action: When social networks really matter." Academy of Management Review **25**(4): 813-828.

It has been argued persuasively that social networks hold relevance for economic action. Yet, in light of the taken-for-granted role of prices, it is crucial to specify when and how social networks influence the efficiency of economic actions taken by actors oriented primarily, as business firms tend to be, toward economic objectives. In this article I contend that when actors need to but cannot, independently or via market mechanisms, cost-effectively ascertain the identity and reliability of potential exchange partners, then scope exists for social networks to appreciably and systematically influence efficiency.

Rao, H., G. F. Davis, et al. (2000). "Embeddedness, social identity and mobility: Why firms leave the NASDAQ and join the New York Stock Exchange." Administrative Science Quarterly **45**(2): 268-292.

Organizations derive their social identity from membership in formal groups and strive to maintain a positive social identity. When their social identity is threatened and group boundaries are permeable, organizations defect to other groups. This paper suggests that organizations receive identity-discrepant cues when in-group members defect to an out-group, but how organizations respond to such cues hinges on their social affiliations to the in-group, out-group, and defectors. A study of organizations that migrated from the NASDAQ stock market to the New York Stock Exchange reveals that strong ties to in-group members (NASDAQ members) reduced the impact of identity-discrepant cues and diminished defections. Conversely, strong ties to out-group members (NYSE members) enhanced the impact of identity-discrepant cues and increased defection. Proximity to defectors increased cross-overs-organizations followed defectors to whom they had direct ties. implications for the study of embeddedness are outlined.

Reagans, R. and E. W. Zuckerman (2001). "Networks, diversity, and productivity: The social capital of corporate R&D teams." Organization Science **12**(4): 502-517.

We argue that the debate regarding the performance implications of demographic diversity can be usefully reframed in terms of the network variables that reflect distinct forms of social capital. Scholars who are pessimistic about the performance of diverse teams base their view on the hypothesis that decreased network density-the average strength of the relationship among team members-lowers a team's capacity for coordination. The optimistic view is founded on the hypothesis that teams that are characterized by high network heterogeneity, whereby relationships on the team cut across salient demographic boundaries, enjoy an enhanced learning capability. We test each of these hypotheses directly and thereby avoid the problematic assumption that they contradict one another. Our analysis of data on the social networks, organizational tenure, and productivity of 224 corporate R&D teams indicates that both network variables help account for

team productivity. These findings support a recasting of the diversity-performance debate in terms of the network processes that are more proximate to outcomes of interest.

Rice, R. E. and C. Aydin (1991). "Attitudes toward new organizational technology - network proximity as a mechanism for social information-processing." Administrative Science Quarterly **36**(2): 219-244.

Survey data are used to test 3 network-based mechanisms whereby individuals' attitudes toward an integrated health information system may be influenced by the attitudes of proximate sources of social information. Estimates of the attitudes of generalized others are not convincingly associated with the actual attitudes of specified others. Overall, specific others' actual attitudes have only a small effect on one's attitude. Social information operates positively through communication and work-unit mechanisms and negatively through the mean attitude of one's structurally equivalent position but not through overall organizational proximity or spatial proximity. Differences in attitudes among occupational groups may have been due to implementation policies.

Rizopoulos, Y. (1999). "Organizational strategies and post-Socialist networks in Russia." Revue D Etudes Comparatives Est-Ouest **30**(2-3): 283-302.

Setting up a new institutional framework in Russia is conditioned by the deep socioeconomic crisis, high degree of uncertainty and menaces against economic actors. In this context, the stability necessary for forming the expectations that foster economic activity is located in the networks that, by structuring organizational strategies for coping with uncertainty, acquire an institutional dimension. The high density of interorganizational flows is at the origin of the practices, codes and rules that influence new models of behavior and their diffusion, the characteristics of markets, or even interactions between the private and public sectors. By favoring the development of quite specific local conventions, post-Socialist networks in Russia break up the nation's socioeconomic space. This might hinder the formation of common representations and norms and hamper the emergence of a relatively coherent and stable institutional framework.

Robins, G. and P. Pattison (2001). "Random graph models for temporal processes in social networks." Journal of Mathematical Sociology **25**(1): 5-41.

We generalize the graphical modeling approach of p^* social influence models to develop discrete time models for the temporal evolution of social networks. Plausible general processes pertaining to network evolution are broadly discussed as a basis for across-time dependence assumptions. Systematic temporal processes are construed as effects that are homogeneous across the network, and that reflect dynamics inherent in a particular social relation. Any one actor cannot control these dynamics, especially given that non-dyadic configurations may be implicated, for instance, tendencies for various triadic configurations to be constructed or to collapse over time. Non-systematic processes, on the other hand, may pertain to the changing nature of a particular dyadic tie, or to change involving a particular sociotemporal neighborhood of the network. Nonsystematic processes are inhomogeneous across time and across the network, and are modeled as random. In constructing p^* dependence graphs, systematic temporal processes may be represented, in part, by the perfect dependence assumption, whereby network across-time dependencies "mirror" within-time dependencies. We develop temporal perfect dependence models appropriate for Markov random graphs. To disentangle non-systematic from systematic temporal processes is not straightforward, but the use of the constant tie assumption - whereby ephemeral ties are assumed not to have influence across time is one possible approach. We illustrate these models with three empirical examples: first, with an analysis of the Freeman EIES data; and then with data from a newly formed small training group involving two networks, trust and friendship.

Rosenthal, E. (1997). "Social networks and team performance." Team Performance Management **3**(4): 288-294.

The results of this research are generalizable to situations in which team performance is dependent upon the coordination and integration of different functional areas or view points. When teams require access to diverse sources of information and/or can benefit from having control advantages, then group networks providing information and control benefits will be associated

with higher performance. One limitation with this study is the small sample size. Regressions would have been more meaningful, and more factors could have been analyzed at the same time, had the sample size been larger. Another shortcoming of this study is the dearth of information about the stages of team development. It was not possible to gauge the developmental stage that teams were in when the performance ratings were given or when members completed surveys. This information might add more to our understanding of how personal networks influence team development and team performance.

Rowley, T., D. Behrens, et al. (2000). "Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries." Strategic Management Journal **21**(3): 369-386.

Network researchers have argued that both relational embeddedness-characteristics of relationships-and structural embeddedness-characteristics of the relational structure- influence firm behavior and performance. Using strategic alliance networks in the semiconductor and steel industries, we build on past embeddedness research by examining the interaction of these factors. We argue that the roles relational and structural embeddedness play in firm performance can only be understood with reference to the other. Moreover, we argue that the influence of these factors on firm performance is contingent on industry context. More specifically, our empirical analysis suggests that strong ties in a highly interconnected strategic alliance network negatively impact firm performance. This network configuration is especially suboptimal for firms in the semiconductor industry. Furthermore, strong and weak ties are positively related to firm performance in the steel and semiconductor industries, respectively.

Rowley, T. J. (1997). "Moving beyond dyadic ties: A network theory of stakeholder influences." Academy of Management Review **22**(4): 887-910.

Stakeholder theory development has increased in recent years, in part because of its emphasis on explaining and predicting how an organization functions with respect to the relationships and influences existing in its environment. Thus far, most researchers have concentrated on dyadic relationships between individual stakeholders and a focal organization. Using social network analysis, I construct in this article a theory of stakeholder influences, which accommodates multiple, interdependent stakeholder demands and predicts how organizations respond to the simultaneous influence of multiple stakeholders.

Rulke, D. L. and J. Galaskiewicz (2000). "Distribution of knowledge, group network structure, and group performance." Management Science **46**(5): 612-625.

This study investigates the effect of knowledge distribution and group structure on performance in MBA game teams. We found that group performance was contingent on the distribution of knowledge within the group and networks of social relationships among group members. Studying 39 teams of MBA students in two management simulation games, we found that, in general, groups that had broadly distributed knowledge, i.e., groups made up of members who had general knowledge, outperformed groups that had knowledge concentrated in different members, i.e., groups made up of members who had specialized or both specialized and general knowledge. However, the advantage that the former enjoyed over the latter disappeared when groups of specialists or mixed groups had decentralized network structures.

Saxonhouse, G. R. (1999). "Technological and information transfer: how do some nations learn what other nations know? Japan's experience." Pacific Review **12**(2): 225-247.

The returns to the rapid acceleration in the growth of gross global product per capita in the past century and a quarter have been very inequitably distributed across nations. Nations that were already relatively wealthy in 1870 have received most of the benefits of this increase in material well-being. Japan is thus far the only major example of a country that has been able to fully traverse the vast gulf that separates poorer from wealthier nations. Lately other economies in East Asia have experienced such sustained high rates of growth in gross domestic product per capita as to suggest they too will join Japan as non-Western examples of the world's wealthiest nations.

Some doubt has been cast on these optimistic projections by findings that economies such as Taiwan and Korea have grown rapidly, seemingly Soviet-bloc style, without the benefit of rapid growth in total factor productivity change. Characterizing growth without total factor productivity change as Stalinist, however, is ahistorical. The United States, the United Kingdom and Japan among other nations, all experienced long periods of rapid growth in per capita GDP without simultaneously experiencing rapid increases in total factor productivity. In each instance, such phases were succeeded by periods where per capita GDP growth was increasingly augmented by improvements in total factor productivity. One puzzle here is that the periods characterized by little total factor productivity change do appear to be times when substantial technological improvement was taking place. In the case of the United States there is considerable evidence that the extraordinary increases in factor accumulation were driven by what appear to be substantial advances in technology. A case study presented for the cotton textile industry suggests much the same may have been true in Japan. The character of the product markets and the factor markets faced by the Japanese cotton-spinning industry in the Meiji period created an environment within which technological adaptation and innovation came to be a network phenomenon with the industry's trade association and the industry's prime machinery supplier serving as a critical link. Later with product market and credit market changes the role these institutions played diminished to be replaced by information transfers that were the byproduct of a very well-functioning market in experienced, and by the standards of other nations, very well-educated textile engineers. In the half-century after 1945, the rise of permanent employment practices in Japan has created barriers to information flows and collective technological innovation and adaptation that were so much a part of the experience of Japan's leading industry in the early twentieth century. Curiously, this is just the time when total factor productivity change has become an important component of Japan's very rapid growth in per capita GDP. The past half-century has also been a time when the Japanese government has been actively involved in attempting to shape industrial structure in an otherwise market-based economy. One set of policy instruments that have attracted particular attention overseas have been government-sponsored R&D consortia. These consortia can be thought of as government programs designed to break down the walls preventing information flows among Japanese firms. Japan's cooperative R&D projects can be thought of as ways to capture some of the benefits of American-style and pre-war Japanese-style labor markets, even while continuing to avoid some of the costs associated with relatively high labor mobility. There is great disagreement as to the efficacy of these Japanese government programs with overseas firms looking enviously at projects that Japanese industry sees as having only minor significance or worse. A study presented here of the impact of two Japanese government-sponsored optoelectronics projects on Japanese and American equity markets confirms these differing perceptions, confirms that the speed with which information diffuses back from Japan to the United States has increased substantially over the past decade, but does not suggest which of the two differing perceptions is correct. Knowledge-based growth may have proceeded this last half-century in Japan with less interfirm diffusion of technology than was characteristic at some points earlier in Japan's history. In the very late twentieth century, changes in global markets and the uncertainty of life close to the technological frontier are forcing changes in Japanese institutions. Japanese firms of the future may prefer to have their labor force bear more both of the risks associated with specialized training and the risks associated with secular and cyclical demand shocks. Much as Japan's labor force did early in the twentieth century, such steps will require a change in the way in which training is provided and changes in the Japanese government's educational and social policies. At the same time the type of information flow problems the government-sponsored R&D consortia were once designed to address may well be as insignificant in the future as they once may have been in Japan's past. In contrast, the type of institutions supporting technological diffusion in Japan's textile industry in the 1920s and early 1930s may be part of Japan's future. On the basis of the evidence presented here, the answer to the question whether Taiwan, Korea and other East and Southeast Asian countries seeking to follow Japan's full transition to very high standards of material well-being and knowledge-based growth should avoid or emulate Japan's institutional set-up of the past half-century is not at all obvious.

Schenk, M., H. Dahm, et al. (1997). "The importance of social networks concerning the diffusion of new communication technology." Kolner Zeitschrift Fur Soziologie Und Sozialpsychologie **49**(1): 35-&.

The diffusion of innovations can be accelerated or slowed down by interpersonal communication in social networks. Nevertheless, there is still a lack of reliable theoretical and empirical concepts of measuring social influence. For analysis of the interpersonal influence the present study combines two different approaches (concept of ego-centered networks and the theory of planned behavior by Ajzen/Fishbein). The study uses a questionnaire with 367 responses from German users and non- users of computer networks. The results point to social networks as a crucial determinant of innovation-decisions, especially in the case of the diffusion of modern communication technology. Not only in the personal core network have early adopters many relations with people who have already adopted the innovation, but also outside of it. In many cases these relations can actually be described as homogeneous, but also as "weak ties". The "innovator's-network" does not only form a pro-innovative background, but it also turns out to be a source of social influence or social pressure urging others to adopt the innovation.

Seibert, S. E., M. L. Kraimer, et al. (2001). "A social capital theory of career success." Academy of Management Journal **44**(2): 219-237.

A model integrating competing theories of social capital with research on career success was developed and tested in a sample of 448 employees with various occupations and organizations. Social capital was conceptualized in terms of network structure and social resources. Results of structural equation modeling showed that network structure was related to social resources and that the effects of social resources on career success were fully mediated by three network benefits: access to information, access to resources, and career sponsorship.

Seidel, M. D. L., J. T. Polzer, et al. (2000). "Friends in high places: The effects of social networks on discrimination in salary negotiations." Administrative Science Quarterly **45**(1): 1-24.

This article tests hypotheses about the effects of social networks on inequitable salary negotiation outcomes using a U.S. high-technology company's salary negotiation data for 1985-1995. Analyzing results of 3,062 actual salary negotiations, we found that members of racial minority groups negotiated significantly lower salary increases than majority members, but this effect was dramatically reduced when we controlled for social ties to the organization. Having a social tie to the organization significantly increased salary negotiation outcomes, and minorities were less likely than majority members to have such a social tie.

Shah, P. P. (1998). "Who are employees' social referents? Using a network perspective to determine referent others." Academy of Management Journal **41**(3): 249-268.

A social network perspective was used to determine whom brokerage firm employees selected as social referents. In particular, this study focused on cohesive actors (friends) and structurally equivalent actors (individuals occupying the same position in a network) as sources of social information. Results on the social networks of brokers, sales assistants, and operations employees (support staff) indicate distinct differences in interaction patterns, information seeking, and social comparison processes across the three job categories. Overall, the results suggest that employees rely on structurally equivalent referents for job-related information and on cohesive referents for general organizational information and as social comparison referents.

Shah, P. P. (2000). "Network destruction: The structural implications of downsizing." Academy of Management Journal **43**(1): 101-112.

Downsizing disrupts existing social networks in organizations. Layoff survivors' reactions to losses of both friends and coworkers in similar structural positions (structural equivalents) are examined here. A field study conducted in a consumer electronics firm revealed negative reactions to the loss of friends and positive reactions to the loss of coworkers in similar structural positions. The loss of friends weakened survivors' network centrality, but the loss of structural equivalents benefited network position and increased satisfaction with promotion opportunities.

Shanley, M. T. and M. E. Correa (1992). "Agreement between Top Management Teams and Expectations for Post Acquisition Performance." Strategic Management Journal **13**(4): 245-266.

This paper addresses theoretical gaps in the relationships among decision maker agreement, social context, and performance. Agreement is considered a multidimensional construct that is embedded in a social context of intergroup relationships. Four dimensions of agreement are specified: (1) perceived agreement, (2) actual agreement, (3) accuracy, and (4) agreement with one's own organization. Understood this way, agreement is associated with success expectations. Empirical tests of hypotheses derived from this view are based on data concerning agreement on acquisition goals by the top management teams from two hospitals in the year following an acquisition. Results support a multidimensional view of agreement, the importance of the intergroup context, and the association of agreement and expectations for success.

Shaw, M. E. (1978). Communication networks fourteen years later. Group processes: Papers from advances in experimental social psychology. L. Berkowitz. New York, Academic Press.

Skvoretz, J. and T. J. Fararo (1996). "Status and participation in task groups: A dynamic network model." American Journal of Sociology **101**(5): 1366-1414.

This article presents a dynamic model for the formation of status orders in small task groups whose members may be differentiated by a diffuse status characteristic. This theoretical strategy embodies "E-state structuralism," which unites the social psychological formalism of expectation states theory with social network research. Using the development of status hierarchies via differential participation in group discussion, the formal model synthesizes (a) the conceptual structure of Fisek, Berger, and Norman, (b) Balkwell's formula for status effects on probabilities of directed participation, and (c) Fararo and Skvoretz's E-state structuralism model for the formation of dominance structures. After describing this synthesis, the article presents the model in axiomatic form and provides a simulation of its dynamic consequences.

Sparrowe, R. T. and R. C. Liden (1997). "Process and structure in leader-member exchange." Academy of Management Review **22**(2): 522-552.

Theory supporting the key premise of the leader-member exchange (LMX) approach to leadership, that leaders differentiate between subordinates, has not been fully developed. We address this deficiency by (a) returning LMX research to its historical roots in exchange processes by introducing a framework for understanding relationship quality that is based on reciprocity, and (b) extending the traditional domain of LMX research beyond the formal leader-subordinate relationship in order to offer a more complete explanation of the differentiation process. We employ insights derived from social network analysis to describe how social structure facilitates the exchange processes through which leaders assist in incorporating some members into the inner life of an organization but exclude others.

Sparrowe, R. T., R. C. Liden, et al. (2001). "Social networks and the performance of individuals and groups." Academy of Management Journal **44**(2): 316-325.

A field study involving 190 employees in 38 work groups representing five diverse organizations provided evidence that social networks, as defined in terms of both positive and negative relations, are related to both individual and group performance. As hypothesized, individual job performance was positively related to centrality in advice networks and negatively related to centrality in hindrance networks composed of relationships tending to thwart task behaviors. Hindrance network density was significantly and negatively related to group performance.

Spender, J. C. (1996). "Making knowledge the basis of a dynamic theory of the firm." Strategic Management Journal **17**: 45-62.

Knowledge is too problematic a concept to make the task of building a dynamic knowledge-based theory of the firm easy. The theory must be distinguished from the resource-based and evolutionary views. A paper presents a multitype epistemology which admits both the pre- and subconscious modes of human knowing and, reframing the concept of the cognizing individual,

the collective knowledge of social groups. M. Callon and B. Latour suggest knowledge itself is dynamic and contained within actor networks, moving from the idea of knowledge as a resource toward the idea of knowledge as a process. To simplify this approach, the sociotechnical systems theory is revisited, 3 heuristics from the social constructionist literature are adopted, and a distinction is made between the systemic and component attributes of the actor network. The result is a very different mode of theorizing, less an objective statement about the nature of firms than a tool to help managers discover their place in the firm as a dynamic knowledge-based activity system.

Stackman, R. W. and C. C. Pinder (1999). "Context and sex effects on personal work networks." Journal of Social and Personal Relationships **16**(1): 39-64.

This study tests hypotheses concerning the similarities and differences between men's and women's instrumental, expressive and overlapping work networks. The study's sample was drawn from three organizations representing distinctly different industries. As expected, women and men differed in several structural characteristics of their expressive networks but, with the exception of homophily (i.e. the number of same-sex ties), their instrumental work networks were essentially similar. In addition, there were systematic differences among the work networks of participants employed by the three organizations. The results support the general proposition that both structural differences and sex influence the patterns of people's networks in the workplace, but that a distinction must be made between individual's instrumental and expressive networks. Implications for future research, through the integration of our findings with other researchers, are addressed in the discussion.

Standifird, S. S. and R. S. Marshall (2000). "The transaction cost advantage of guanxi-based business practices." Journal of World Business **35**(1): 21-42.

The purpose of this paper is to provide a theoretical explanation of the perpetuation of China's guanxi-based business practices. As a complement to the social embeddedness- and resource-based explanations, we seek to demonstrate the perseverance and relevance of guanxi in terms of the transaction cost advantages it offers. Specifically, we argue that guanxi-based business practices offer certain transaction cost advantages over existing structural alternatives identified in transaction cost theory. Where the guanxi network is well developed, the transaction cost advantages of guanxi-based exchange are sufficient to warrant the integration of guanxi- and market-based exchange mechanisms.

Stevenson, W. B. and M. C. Gilly (1993). "Problem-Solving Networks in Organizations - Intentional Design and Emergent Structure." Social Science Research **22**(1): 92-113.

There has been little formal research into the effects of formal designs and networks of ties on the flow of information within organizations. The process through which problems are solved in a hospital is examined.

Stevenson, W. B. and D. Greenberg (2000). "Agency and social networks: Strategies of action in a social structure of position, opposition, and opportunity." Administrative Science Quarterly **45**(4): 651-678.

This study uses social movement concepts to explain the success and failure of actors in a network of relationships trying to influence policies on environmental issues in a small city. Results show that strategies to take action and mobilize others in a network of interorganizational relationships can vary depending on the social context, which consists of the political opportunity structure defined by government regulators, whether the actor faces opposition, and the actor's position in the network. Decisions to engage in strategies to try to influence government regulators directly, to use a broker to reach agreements with the opposition, or to form a coalition with actors in other organizations to influence government decision makers are affected by this social context. Results also show that even peripheral actors, usually assumed to be powerless in network studies, can influence policy if they use a direct-contact strategy and the political opportunity structure is favorable.

Strang, D. and S. A. Soule (1998). "Diffusion in organizations and social movements: From hybrid corn to poison pills." Annual Review of Sociology **24**: 265-290.

There has been rapid growth in the study of diffusion across organizations and social movements in recent years, fueled by interest in institutional arguments and in network and dynamic analysis. This research develops a sociologically grounded account of change emphasizing the channels along which practices flow. Our review focuses on characteristic lines of argument, emphasizing the structural and cultural logic of diffusion processes. We argue for closer theoretical attention to why practices diffuse at different rates and via different pathways in different settings. Three strategies for further development are proposed: broader comparative research designs, closer inspection of the content of social relations between collective actors, and more attention to diffusion industries run by the media and communities of experts.

Straub, D. and E. Karahanna (1998). "Knowledge worker communications and recipient availability: Toward a task closure explanation of media choice." Organization Science **9**(2): 160-175.

The authors further extend the study of media choice by incorporating concepts of social presence and recipient availability. Availability is of growing interest in the study of organizational communication, particularly as firms become more geographically distributed. At least two aspects of availability are of interest, given multiple media alternatives for communication: the impact of new electronic media on people's availability to communicate with one another, and the influence of a specific level of availability on a sender's media choice. A future paper in *Organization Science*, by Marjorie Sarbaugh-Thompson and Martha Feldman, will further explore the availability concept.

Stuart, T. E. (1998). "Network positions and propensities to collaborate: An investigation of strategic alliance formation in a high- technology industry." Administrative Science Quarterly **43**(3): 668-698.

The paper develops a network-based mapping of the technological positions of the firms in an industry and applies this model in a longitudinal study of the formation of alliances between organizations. In the analysis, the positions of high- technology firms in their competitive environment are stratified on two dimensions: crowding and prestige. Organizations in crowded positions are those that participate in technological segments in which many firms actively innovate, and prestigious firms are those with a track record of developing seminal inventions. The study's principal empirical findings are that firms in crowded positions and those with high prestige form alliances at the highest rates. The statistical analyses, performed on a sample of semiconductor firms during a six-year period, demonstrate that crowding and prestige predict alliance formations at the firm level (which organizations establish the greatest number of alliances) and at the dyad level (which particular pairs of firms choose to collaborate).

Stuart, T. E. (2000). "Interorganizational alliances and the performance of firms: A study of growth and innovation rates in a high-technology industry." Strategic Management Journal **21**(8): 791-811.

This paper investigates the relationship between intercorporate technology alliances and firm performance. It argues that alliances are access relationships and therefore that the advantages which a focal firm derives from a portfolio of strategic coalitions depend upon the resource profiles of its alliance partners. In particular large firms and those that possess leading-edge technological resources are posited to be the most valuable associates. The paper also argues that alliances are both pathways for the exchange of resources and signals that convey social status and recognition. Particularly when one of the firms in an alliance is a young or small organization or, more generally an organization of equivocal quality, alliances can act as endorsements: they build public confidence in the value of an organization's products and services and thereby facilitate the firm's efforts to attract customers and other corporate partners. The findings from models of sales growth and innovation rates in a large sample of semiconductor producers confirm that organizations with large and innovative alliance partners perform better than otherwise comparable firms that lack such partners. Consistent with the status-transfer arguments, the findings also demonstrate that young and small firms benefit more from large and innovative strategic alliance partners than do old and large organizations.

Swan, J. A. and R. D. Galliers (1996). "Networking: The future of information systems." Data Base for Advances in Information Systems 27(4): 92-98.

How will the role of the information systems (IS) professional develop during the first half of the 21st Century? What will be the kinds of skills required for them to make a useful contribution in the provision of information systems? This paper reflects on these issues, drawing on the IS and innovation diffusion literatures. Following a review of electronic vis a vis social networks, the paper foresees the latter as crucial in the construction and diffusion of new knowledge in an IS community. A main contribution of the paper is that it utilizes a variety of disciplinary perspectives in order better to understand and improve use of information in organizations. This approach is in line with the view that in the future transdisciplinary forms of knowledge production will make traditional, disciplinary-based knowledge domains largely obsolete (Gibbons, 1995) and that knowledge relevant to IS professionals will be no different in this respect. Given this, the future role of the IS professional is portrayed here as that of a key change agent in the development, diffusion, and implementation of new ideas. A primary activity is foreseen as being one of bringing together and synthesising information, ideas, and practices from a range of disciplines with the focus being on information leading to the development of knowledge leading to the development of knowledge and expertise within organizations, not systems per se. The paper concludes by identifying implications of this analysis for IS curriculum development.

Tan, C. Z. and H. W. C. Yeung (2000). "The regionalization of Chinese business networks: A study of Singaporean firms in Hainan, China." Professional Geographer 52(3): 437-454.

This paper examines the central role of social and political institutions behind motivations and strategies of ethnic Chinese Singaporean investment in Huinan, China. Drawing upon 22 case studies of Singaporean firms in Hainan, we show that Singaporean investment in Hainan is embedded in Chinese business networks and their associated institutions. At the personal level, direct investments are largely motivated by the cultural attachments of Singaporean Hainanese to Hainan. Their small- and medium-sized joint ventures largely reflect the characteristics of ethnically-based Chinese business networks that stress connections, or *guanxi*. Similarly the influence of social organizations (e.g., clan associations) anti government institutions (e.g., public and quasi-public agencies) on Singaporean investment strategies in Hainan reveals the significance of ongoing social relations institutionalized at the broader societal level.

Tsai, W. and S. Ghoshal (1998). "Social capital and value creation: The role of intrafirm networks." Academy of Management Journal 41(4): 464-476.

Using data collected from multiple respondents in all the business units of a large multinational electronics company, we examined the relationships both among the structural, relational, and cognitive dimensions of social capital and between those dimensions and the patterns of resource exchange and product innovation within the company. Social interaction, a manifestation of the structural dimension of social capital, and trust, a manifestation of its relational dimension, were significantly related to the extent of interunit resource exchange, which in turn had a significant effect on product innovation.

Tsai, W. P. (2000). "Social capital, strategic relatedness and the formation of intraorganizational linkages." Strategic Management Journal 21(9): 925-939.

This paper investigates the evolutionary dynamics of network formation by analyzing how organizational units create new interunit linkages for resource exchange. Using sociometric techniques and event history analysis, this study predicts the rate at which new interunit linkages are created between a newly formed unit and all the existing units in a large multinational organization. Two important constructs: social capital, derived from the literature on social structure and network formation, and strategic relatedness, derived from research on diversification and the resource-based view of the firm, are used to explain the rate of new linkage

creation. Results show, that the interaction between social capital and strategic relatedness significantly affects the formation of intraorganizational linkages.

Tsai, W. P. (2002). "Social structure of "coopetition" within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing." Organization Science **13**(2): 179-190.

Drawing on a social network perspective of organizational coordination, this paper investigates the effectiveness of coordination mechanisms on knowledge sharing in intraorganizational networks that consist of both collaborative and competitive ties among organizational units. Internal knowledge sharing within a multiunit organization requires formal hierarchical structure and informal lateral relations as coordination mechanisms. Using sociometric techniques, this paper analyzes how formal hierarchical structure and informal lateral relations influence knowledge sharing and how interunit competition moderates the association between such coordination mechanisms and knowledge sharing in a large, multiunit company. Results show that formal hierarchical structure, in the form of centralization, has a significant negative effect on knowledge sharing, and informal lateral relations, in the form of social interaction, have a significant positive effect on knowledge sharing among units that compete with each other for market share, but not among units that compete with each other for internal resources.

Uzzi, B. (1997). "Social structure and competition in interfirm networks: The paradox of embeddedness." Administrative Science Quarterly **42**(1): 35-67.

The purpose of this work is to develop a systematic understanding of embeddedness and organization networks. Drawing on ethnographic fieldwork conducted at 23 entrepreneurial firms, I identify the components of embedded relationships and explicate the devices by which embeddedness shapes organizational and economic outcomes. The findings suggest that embeddedness is a logic of exchange that promotes economies of time, integrative agreements, Pareto improvements in allocative efficiency, and complex adaptation. These positive effects rise up to a threshold, however, after which embeddedness can derail economic performance by making firms vulnerable to exogenous shocks or insulating them from information that exists beyond their network. A framework is proposed that explains how these properties vary with the quality of social ties, the structure of the organization network, and an organization's structural position in the network.

Valente, T. W. (1996). "Social network thresholds in the diffusion of innovations." Social Networks **18**(1): 69-89.

Threshold models have been postulated as one explanation for the success or failure of collective action and the diffusion of innovations. The present paper creates a social network threshold model of the diffusion of innovations based on the Ryan and Gross (1943) adopter categories: (1) early adopters; (2) early majority; (3) late majority; (4) laggards. This new model uses social networks as a basis for adopter categorization, instead of solely relying on the system-level analysis used previously. The present paper argues that these four adopter categories can be created either with respect to the entire social system, or with respect to an individual's personal network. This dual typology is used to analyze three diffusion datasets to show how external influence and opinion leadership channel the diffusion of innovations. Network thresholds can be used (1) to vary the definition of behavioral contagion, (2) to predict the pattern of diffusion of innovations, and (3) to identify opinion leaders and followers in order to understand the two-step flow hypothesis better.

Valente, T. W. and R. L. Davis (1999). "Accelerating the diffusion of innovations using opinion leaders." Annals of the American Academy of Political and Social Science **566**: 55-67.

Theory on the diffusion of innovations has been used to study the spread of new ideas and practices for over 50 years in a wide variety of settings. Most studies have been retrospective, and most have neglected to collect information on interpersonal communication networks. In addition, few have attempted to use the lessons from diffusion research to accelerate the diffusion of innovations. This article outlines a method to accelerate the diffusion of innovations using opinion

leaders. The authors present their optimal matching procedure and report on computer simulations that show how much faster diffusion occurs when initiated by opinion leaders. Limitations and extensions of the model are discussed.

Wallace, R. and D. Wallace (1997). "Socioeconomic determinants of health - Community marginalisation and the diffusion of disease and disorder in the United States." British Medical Journal **314**(7090): 1341-1345.

This article describes the cascading diffusion of "inner city problems" of disease and disorder in the United States-from the huge marginalised inner city communities of the largest municipalities, first along national travel routes to smaller cities, and then from central cities into surrounding more affluent suburbs-following the pattern of the daily journey to work public policies and economic practices which increase marginalisation act to damage the "weak ties" of the community social networks which bind central city neighbourhoods into functioning units. Spreading disease and disorder can be interpreted as indices of the resulting social disintegration, which is driven by policy. This "failure of containment" in the United States should serve as a warning for cities in Europe against reducing the municipal and other services that they provide to "unpopular" subpopulations.

Wang, W. Y. (2000). "Informal institutions and foreign investment in China." Pacific Review **13**(4): 525-556.

During the reform era, China has been very successful in attracting foreign direct investment (FDI) for its economic development. That this has taken place despite a rather weak legal system in China challenges conventional institutional theories, which emphasize the centrality of effective state institutions to economic development and international cooperation. This article suggests that the solution to the puzzle lies in the informal institutions underlying FDI development in China. On the basis of extensive interviews in the mid- and late 1990s, I find that networks of personal connections (guanxi), which are pervasive in Chinese society, have played a major role in facilitating FDI flows to China. They have done so by complementing and compensating for the weak Chinese legal system. This article dispels a number of misconceptions about the nature of guanxi, discusses its relationship with friendship, bribery, and social capital, and analyzes the conditions underlying the transnationalization of guanxi networks. It concludes with some important caveats to the major thesis and a discussion of possible future scenarios of institutional development in China.

Warriner, G. K. and T. M. Moul (1992). "Kinship and personal communication - network influences on the adoption of agriculture conservation technology." Journal of Rural Studies **8**(3): 279-291.

An analysis of personal communication network properties and kinship ownership arrangements of the farm provides further evidence of factors influencing the decision to adopt conservation tillage practices. Data from a mail survey of south-western Ontario, Canada, farmers demonstrate a positive connection between adoption of conservation forms of tillage and farming with a family member (other than spouse). Hypotheses relating to the structural properties of personal communications networks - connectedness, integration and diversity - are offered as potential explanations for the relation between kinship ownership and conservation adoption. Logistic regression reveals the positive influence of network connectedness on adoption and the negative influence of network integration, partially confirming that social network variables influence innovation adoption, but failing to account wholly for the influence of kin ownership arrangements in this decision. Kin members in the personal network lead to larger networks, as well as members who are more specialized and informed on innovative farming technologies. Alternatively, networks mainly comprised of kin are smaller and more integrated, both factors associated to lesser receptivity for innovative conservation forms of farming. The results are discussed in the context of the inconclusive findings to date of the influence of kin in the diffusion of innovations model for rural sociology.

Wasserman, S. and K. Faust (1994). Social Network Analysis. Cambridge, MA, Cambridge University Press.

Watts, D. J. and S. H. Strogatz (1998). "Collective dynamics of 'small-world' networks." Nature **393**(6684): 440-442.

Networks of coupled dynamical systems have been used to model biological oscillators(1-4), Josephson junction arrays(5,6), excitable media(7), neural networks(8-10), spatial games(11), genetic control networks(12) and many other self-organizing systems. Ordinarily, the connection topology is assumed to be either completely regular or completely random. But many biological, technological and social networks lie somewhere between these two extremes. Here we explore simple models of networks that can be tuned through this middle ground: regular networks 'rewired' to introduce increasing amounts of disorder. We find that these systems can be highly clustered, like regular lattices, yet have small characteristic path lengths, like random graphs. We call them 'small-world' networks, by analogy with the small-world phenomenon(13,14) (popularly known as six degrees of separation(15)). The neural network of the worm *Caenorhabditis elegans*, the power grid of the western United States, and the collaboration graph of film actors are shown to be small-world networks. Models of dynamical systems with small-world coupling display enhanced signal-propagation speed, computational power, and synchronizability. In particular, infectious diseases spread more easily in small- world networks than in regular lattices.

Wellman, B. (2001). "Computer networks as social networks." Science **293**(5537): 2031-2034.

Computer networks are inherently social networks, linking people, organizations, and knowledge. They are social institutions that should not be studied in isolation but as integrated into everyday lives. The proliferation of computer networks has facilitated a deemphasis on group solidarities at work and in the community and afforded a turn to networked societies that are Loosely bounded and sparsely knit. The Internet increases people's social capital, increasing contact with friends and relatives who Live nearby and far away. New toots must be developed to help people navigate and find knowledge in complex, fragmented, networked societies.

Wellman, B. (2001). "Physical place and cyberplace: The rise of personalized networking." International Journal of Urban and Regional Research **25**(2): 227-+.

Computer networks are social networks. Social affordances of computer-supported social networks - broader bandwidth, wireless portability, globalized connectivity, personalization - are fostering the movement from door-to-door and place-to- place communities to person-to-person and role-to-role communities. People connect in social networks rather than in communal groups. In-person and computer-mediated communication are integrated in communities characterized by personalized networking.

Wellman, B. and S. D. Berkowitz, Eds. (1988). Social Structures: A Network Approach. Greenwich, CT, JAI Press.

Wellman, B., J. Salaff, et al. (1996). "Computer networks as social networks: Collaborative work, telework, and virtual community." Annual Review of Sociology **22**: 213-238.

When computer networks link people as well as machines, they become social networks. Such computer-supported social networks (CSSNs) are becoming important bases of virtual communities, computer-supported cooperative work, and telework. Computer- mediated communication such as electronic mail and computerized conferencing is usually text-based and asynchronous. It has limited social presence, and on-line communications are often more uninhibited, creative, and blunt than in-person communication. Nevertheless, CSSNs sustain strong, intermediate, and weak ties that provide information and social support in both specialized and broadly based relationships. CSSNs foster virtual communities that are usually partial and narrowly focused, although some do become encompassing and broadly based. CSSNs accomplish a wide variety of cooperative work, connecting workers within and between organizations who are often physically dispersed. CSSNs also link teleworkers from their homes or remote work centers

to main organizational offices. Although many relationships function off-line as well as on-line, CSSNs have developed their own norms and structures. The nature of the medium both constrains and facilitates social control. CSSNs have strong societal implications, fostering situations that combine global connectivity, the fragmentation of solidarities, the de-emphasis of local organizations (in the neighborhood and workplace), and the increased importance of home bases.

West, E., D. N. Barron, et al. (1999). "Hierarchies and cliques in the social networks of health care professionals: implications for the design of dissemination strategies." *Social Science & Medicine* **48**(5): 633-646.

Interest in how best to influence the behaviour of clinicians in the interests of both clinical and cost effectiveness has rekindled concern with the social networks of health care professionals. Ever since the seminal work of Coleman et al. [Coleman, J.S., Katz, E., Menzel, H., 1966. *Medical Innovation: A Diffusion Study*. Bobbs-Merrill, Indianapolis.], networks have been seen as important in the process by which clinicians adopt (or fail to adopt) new innovations in clinical practice. Yet very little is actually known about the social networks of clinicians in modern health care settings. This paper describes the professional social networks of two groups of health care professionals, clinical directors of medicine and directors of nursing, in hospitals in England. We focus on network density, centrality and centralisation because these characteristics have been linked to access to information, social influence and social control processes. The results show that directors of nursing are more central to their networks than clinical directors of medicine and that their networks are more hierarchical. Clinical directors of medicine tend to be embedded in much more densely connected networks which we describe as cliques. The hypotheses that the networks of directors of nursing are better adapted to gathering and disseminating information than clinical directors of medicine, but that the latter could be more potent instruments for changing, or resisting changes, in clinical behaviour, follow from a number of sociological theories. We conclude that professional socialisation and structural location are important determinants of social networks and that these factors could usefully be considered in the design of strategies to inform and influence clinicians. (C) 1999 Elsevier Science Ltd. All rights reserved.

Westphal, J. D. and L. P. Milton (2000). "How experience and network ties affect the influence of demographic minorities on corporate boards." *Administrative Science Quarterly* **45**(2): 366-398.

This study examines how the influence of directors who are demographic minorities on corporate boards is contingent on the prior experience of board members and the larger social structural context in which demographic differences are embedded. We assess the effects of minority status according to functional background, industry background, education, race, and gender for a large sample of corporate outside directors at Fortune/Forbes 500 companies. The results show that (1) the prior experience of minority directors in a minority role on other boards can enhance their ability to exert influence on the focal board, while the prior experience of minority directors in a majority role can reduce their influence; (2) the prior experience of majority directors in a minority role on other boards can enhance the influence of minority directors on the focal board, and (3) minority directors are more influential if they have direct or indirect social network ties to majority directors through common memberships on other boards. Results suggest that demographic minorities can avoid out-group biases that would otherwise minimize their influence when they have prior experience on other boards or social network ties to other directors that enable them to create the perception of similarity with the majority.

Westphal, J. D. and E. J. Zajac (1997). "Defections from the inner circle: Social exchange, reciprocity, and the diffusion of board independence in US corporations." *Administrative Science Quarterly* **42**(1): 161-183.

This study seeks to reconcile traditional sociological views of the corporate board as an instrument of elite cohesion with recent evidence of greater board activism and control over top management. We propose that CEO-directors may typically support fellow CEOs by impeding increased board control over management but that CEO-directors may also foster this change if they have experienced it in their own corporation. Drawing on social exchange theory, we develop and test the argument that these CEO-directors may experience a reversal in the basis for generalized

social exchange with other top managers from one of deference and support to one of independence and control. Using data from a large sample of major U.S. corporations over a recent ten-year period, we show (1) how CEO-directors "defect" from the network of mutually supportive corporate leaders, (2) how defections have diffused across organizations and over time, and (3) how this has contributed to increased board control, as measured by changes in board structure, diversification strategy, and contingent compensation. We also provide evidence that a social exchange perspective can explain the diffusion of these changes better than more conventional perspectives on network diffusion that emphasize imitation or learning.

Wolfe, A. W. (1978). "Rise of network thinking in anthropology." *Social Networks* 1(1): 53-64.

The encyclopedic inventory of the first half of the twentieth century, "Anthropology Today", published in 1953, gave little inkling that within a few decades developing trends in social theory, in field experience, in electronic data processing, and in mathematics would combine to bring to prominence a distinctive theoretical approach using a quite formal network model for social systems. Now, sophisticated mathematics and computer programming permit sophisticated network models - networks seen as setz of links, networks seen as generated structures, and networks seen as flow processes. Although network thinking has shown a dramatic rise from "Anthropology Today" of 1953 to the current anthropology in 1978, it is predicted to soar in te next quarter century, much of the weighty burden of network analysis having been lifted from us by ever more rapid electronic data processing.

Woolcock, M. and D. Narayan (2000). "Social capital: Implications for development theory, research, and policy." *World Bank Research Observer* 15(2): 225-249.

In the 1990s the concept of social capital-defined here as the norms and networks that enable people to act collectively- enjoyed a remarkable rise to prominence across all the social science disciplines. The authors trace the evolution of social capital research as it pertains to economic development and identify four distinct approaches the research has taken: communitarian, networks, institutional and synergy. The evidence suggests that of the four, the synergy view, with its emphasis on incorporating different levels and dimensions of social capital and its recognition of the positive and negative outcomes that social capital can generate, has the greatest empirical support and lends itself best to comprehensive and coherent policy prescriptions. The authors argue that a significant virtue of the idea of and discourse on social capital is that it helps to bridge orthodox divides among scholars, practitioners, and policymakers.

Yli-Renko, H., E. Autio, et al. (2001). "Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms." *Strategic Management Journal* 22(6-7): 587-613.

Employing a sample of 180 entrepreneurial high-technology ventures based in the United Kingdom, we examine the effects of social capital in key customer relationships on knowledge acquisition and knowledge exploitation. Building on the relational view and on social capital and knowledge-based theories, we propose that social capital facilitates external knowledge aquisition in key customer relationships and that such knowledge mediates the relationship between social capital and knowledge exploitation for competitive advantage. Our results indicate that the social interaction and network ties dimensions of social capital are indeed associated with greater knowledge acquisition, but that the relationship quality dimension is negatively associated with knowledge acquisition. Knowledge acquisition is, in turn, positively associated with knowledge exploitation for competitive advantage through new product development, technological distinctiveness, and sales cost efficiency. Further our results provide evidence that knowledge acquisition plays a mediating role between social capital and knowledge exploitation.

Zack, M. H. and J. L. McKenney (1995). "Social context and interaction in ongoing computer-supported management groups." *Organization Science* 6(4): 394-422.

Electronic communication has been proposed as a key technology enabling new organization forms and structures, work designs, and task processes. This view assumes that organization structure and form can be defined in terms of communication linkages among organizational units.

Communication is a social process, however. Therefore, to better understand the potential for these technologies to enable fundamental organizational change, we must understand how existing structures and social contexts influence patterns of organizational communication. This research examined the use of electronic messaging by ongoing management groups performing a cooperative task. By means of an in-depth multimethod field study of the editorial group of two daily newspapers, it examined the influence of the groups' social context on the patterns of face-to-face and computer-mediated communication. The results show that different groups using the same functional structure and performing the same task with identical communication technologies, but operating within different social contexts, appropriated the communication technology differently. This finding suggests that researchers must, at the very least, explicitly take into account social context when studying the effects of introducing technologies which may alter group interaction. Additionally, researchers should look to social context as an important explanatory construct to be explicitly varied and investigated with regard to effects and outcomes of these technologies. The findings also suggest that managers must diagnose and explicitly manage the social context of the workplace prior to implementing technologies, if their intent is to restructure the patterns of interaction and information exchange in support of new organizational forms.

Zeggelink, E. (1995). "Evolving Friendship Networks - an Individual-Oriented Approach Implementing Similarity." *Social Networks* **17**(2): 83-110.

This article is an extension to Zeggelink (1994) which introduced the individual-oriented approach to model the evolution of networks. In this approach, the dynamics of friendship network structure are considered as a result of individual choices with regard to friendship relationships. Individuals have specific characteristics and behavioral rules. The previous model was based solely on individuals' different needs for social contact. In the model presented here, we introduce another important determinant of friendship formation: preferences for similar friends. The amount of heterogeneity of the distribution of individual characteristics on which this similarity is based thus becomes important. In contrast to most existing dynamic social network models, this aspect of heterogeneity, as well as dependence of dyads, can easily be dealt with. We examine how individual characteristics and preferences (individual attributes at the micro level) with respect to prospective friendship relations interact and aggregate to outcomes at the macro level: the network structure.