

## II. NETWORK STRUCTURE

### A. IMPACT OF STRUCTURE ON OUTCOMES

#### Summary

Articles identify connections between various aspects of network structure and the outcomes that the network and organizations within the network experience. These connections include:

- contentious action: Barkey & Van Rossem's (1997) study of Ottoman villages illustrates two predictors contentious action: an intermediate level of centrality, which exposes the village to network processes but limits the benefits it receives; and sufficient internal organization and cohesion so that group action is possible and conflict doesn't turn inward.
- impact of CEO networks on strategy choice and outcome: Geletkanycz & Hambrick (1997) show that CEOs with more extraindustry ties are likely to pursue less conformist strategies, and that those who attempt non-conformist strategies have more successful outcomes if they have extraindustry ties to support them.
- domain similarity: Human & Provan (1997) offer evidence that small manufacturer networks (SMEs) with a high degree of domain similarity tend to experience both transformational outcomes (changes in manager thinking) and transactional (resource opportunities), while those with low domain similarity achieve mainly transactional outcomes.
- negative relationships, conflict and cohesion: LaBianca, Brass, & Gray (1998) show that negative relationships with out-group members increase in-group members sense of conflict between the two groups, but positive relationships do not significantly reduce this perceived conflict. Groups with a low degree of internal cohesion are more likely to perceive conflict with the out-group.
- niche position and organizational survival: Podolny, Stuart & Hannan (1996) develop the concept of niche to show that: (1) a crowded niche position is negatively associated with firms' survival in a competitive market, and (2) the firm's status or prestige positively predicts survival, though this effect decreases as crowding increases.
- niche position and voluntary association homogeneity: Popielarz & McPherson (1995) use the niche concept to explain why voluntary associations are so homogeneous. "Niche edge" says that different members are less likely to have strong ties holding them into the organization and "niche overlap" that those on the edge are more likely to find that other organizations are competing for their membership.
- integration in service provider networks: Provan & Milward (1995) and Provan & Sebastian (1998) find that mental health systems are most effective when they are strongly centrally integrated, so that coordination is possible, but not strongly decentrally integrated, as these double links can lead to inefficiencies. The relationship between non-core agencies should be one of "service link overlap," strongly integrated cliques with weak links to one another.
- CEO characteristics and international interdependence: Roth's (1995) findings suggest that certain CEO characteristics prove especially beneficial in coordinating and integrating in firms facing a high degree of international interdependence. These include

a greater locus of control (which encourages information-processing effort) and being a “feeling type” (which makes it easier to attend to others’ need in situations requiring a great deal of coordination.

- power in exchange networks: Yamaguchi (1996) argues, and illustrates with data from earlier experiments, that while power in communications network is determined more by structure (network position), power in exchange networks depends also on relational factors—the extent of substitutability and complementarity in an actor’s exchange relations.
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*Karen Barkey & Ronan Van Rossem, Networks of Contention: Villages and Regional Structure in the Seventeenth-Century Ottoman Empire, 102 American Journal of Sociology 1345 (March 1997)*

Case study of peasant contention in the 17<sup>th</sup> century Ottoman Empire is designed to examine the embeddedness of contentious action in inter- and intra-village structures. Blockmodel analysis of data from village court records supports the theory that village structure and inter-village networks, rather than class interests, are important determinants of contentious action. Authors first point to intravillage solidarity as providing the means for contention. They cite the notion of a “catnet” to describe the most favorable conditions for mobilization—groups with common interests (categories) coincide with groups with strong interests among its members (networks) and the combination is ideal for the diffusion of discontent. These catnets are more likely to arise within local communities than in disparate class organizations. Specifically, authors show support for hypotheses that: (1) contentious action is less likely to arise in villages with low community organization; and (2) organized but fragmented villages (i.e., those torn by cleavages of religion, occupation, class, etc.) are less likely to turn to contention because conflicts remain inner-oriented.

A second determinant for contention is the village’s place within intervillage linkages. Villages with an intermediate level of ties to other villages in the region are most likely to turn to contention. Isolated villages in the Ottoman Empire escaped the pressures of state expansion and commercialization, while central villages adapted rapidly and became the first to benefit from these processes. Intermediate villages are exposed to the processes but do not immediately benefit. Authors point to the importance of the village as a unit of analysis, with both position in the regional structure and internal organization as key determinants of its orientation towards intervillage contention.

*Marta A. Geletkanycz & Donald C. Hambrick, The External Ties of Top Executives: Implications for Strategic Choice and Performance, 42 Administrative Science Quarterly 654 (December 1997)*

Article examines the effect of executives’ boundary-spanning ties inside and outside their industry on their organizations’ strategy and performance. First, authors hypothesize that an executive team’s intraindustry ties will be positively related to strategic conformity, because the tendency for shared industry views combined with the homogenizing effect of social interaction is likely to diminish the ability to see novel opportunities. Second, extraindustry ties will be negatively related to conformity because their views will be shaped by experiences that diverge from those of the focal industry. Authors also predict how these ties are likely to affect performance. First, they

hypothesize that the association between conformity and performance will be more positive for firms operating in an uncertain environment, because uncertainty makes it more difficult to identify which novel strategies are superior to the standard ones. They also predict that: (1) the greater the combination of strategic conformity and executive team intraindustry ties, the higher the firm's performance; and (2) the greater the combination of strategic nonconformity and extraindustry ties, the higher the performance. The rationale is that intraindustry ties will help executives pursuing a conformist strategy to comprehend the subtleties of execution, and that similarly extraindustry ties provide insight into nonconformist strategies that may permit an executive to avoid costly trial and error.

Pooled time-series GLS regression on food and computer industry data shows that some types of intraindustry ties are significantly and positively related to conformity, and offered strong support for the negative relationship between extraindustry ties and conformity, and for the more positive effect of conformity on performance in an uncertain environment. The evidence of a conformity/intraindustry interactive effect on performance was weak, though an interactive effect on performance was observed for conformity and some types of extraindustry ties. Authors emphasize that their results show that unique strategies are not always advantageous, and that their beneficial effect may depend on what ties are available to support them and how much risk the industry faces.

*Sherrie E. Human & Keith G. Provan, An Emergent Theory of Structure and Outcomes in Small-Firm Strategic Manufacturing Networks, 40 Academy of Management Journal 368 (April 1997)*

Qualitative and quantitative study of firms in the U.S. wood products industry, analyzing structure of two small-to-medium-sized-enterprise networks (SMEs). Central to their study was the concept of domain similarity—low variation in product line, and the distinction between administrative (network-as-organization) and interactive (network-as-interaction structures). They found, first, that a domain-similar network is likely to have a stronger central administrative structure and a higher density interactive structure than one with low domain similarity. They suggest that similar firms are more likely to view each other as competitors, and so to need coordination in order to act cooperatively. Also, while dissimilar firms can easily make traditional, non-network links to exchange critical resources, no such stabilizing asymmetries exist for similar firms, so they must make a dense set of connections to achieve stability. Second, for domain-similar firms, both transactional (resource acquisition, performance gains) and transformational outcomes (changes in the way managers think or act) occur in a network with a central and active administration and dense and decentralized interactive structure. By contrast, for firms with low domain similarity, transactional, but not transformational outcomes occur with a central and active administration and a low-density but centralized administrative structure. In dissimilar networks with dissimilar concerns, frequent interaction and coordinated thinking is not seen as essential to success, while both types of network can gain valuable resources with the assistance of a strong leadership.

*Giuseppe Labianca, Daniel J. Brass, Barbara Gray, Social Networks and Perceptions of Intergroup Conflict: The Role of Negative Relationships and Third Parties, 41 Academy of Management Journal 55 (February 1998)*

The authors conduct a Quadratic Assignment Procedure analysis on employee survey data from a health center. Psychological theory and experiment suggests a “negative asymmetry” in the impact of events and relationships on human attitudes. Based on this idea, the authors test and find support for the hypothesis that an individual’s number of negative interpersonal relationships with an out-group’s members would be a stronger predictor of her perceptions of intergroup conflict than the number of friendships with out-group members. They also find that indirect relationships amplify perceptions—that the number of friendships one has with people involved in negative relationships with out-group members is positively associated with perception of intergroup conflict. Similarly, the number of friendships with people involved in friendships with out-group members is negatively associated with conflict perception. A final theory suggests that in-group relationships spill over into out-groups, that problematic relationships in one’s own group spill over into negative attitudes towards the out-group. They test and find support for the hypothesis that in-group cohesiveness is negatively associated with perceptions of intergroup conflict.

*Joel M. Podolny, Toby E. Stuart & Michael T. Hannan, Networks, Knowledge, and Niches: Competition in the Worldwide Semiconductor Industry, 1984-1991, 102 American Journal of Sociology 659 (November 1996)*

Study of competition in the semiconductor industry develops a theory of organizational life chances based on the organization’s niche, which is defined by crowding and status. First, they expect an organization’s life chances to decline monotonically with crowding. Crowding is the sum of niche overlaps, and a niche overlap between two organizations is a function of their degree of common dependence on prior inventions as a foundation for their research. Crowding should reduce the organization’s life chances because the more that one firm pursues its market possibilities, the more limited is a similar or redundant organization’s ability to pursue its opportunities. Second, organizational life chances are hypothesized to increase with the organization’s status, and third, the positive effect of status is predicted to decline with crowding. Where status is defined by the sum of acts of public deference the organization has received (or in an alternative measure, by the sum of acts weighted by the actor’s status), status provides signals of quality in technological markets where quality is uncertain. Quality is more likely to be uncertain in uncrowded niches. In their model of the semiconductor industry, authors measure niche overlap by the overlap of patent citations between two organizations, and status is the number of citations an organization receives. OLS regression using fixed-effects specification, with firm growth as a dependent variable, reveals support for all three hypotheses. Authors argue that future research can develop a general sociological theory of competition emphasizing the duality of actor and position across many domains (for example, document flows might define the niches of departments within law firms, or journal citations a scientist’s or research program’s position).

*Pamela A. Popielarz & J. Miller McPherson, On the Edge or In Between: Niche Position, Niche Overlap, and the Duration of Voluntary Association Memberships, 101 American Journal of Sociology 698 (November 1995)*

Authors test hypotheses that might explain the homogeneity of voluntary associations, which is seen as a significant barrier to social integration. They note that, because of homophilous ties, new recruits are not a random sample, but point out that each tie will lead to a few new members just outside the group's niche, so that recruitment alone probably does not explain the homogeneity. They offer and test two main theories. First, there is "niche edge"—members near the edge of the organization tend to leave at a higher rate than those near the center, because the network ties pulling them out of the group are stronger than those keeping them in. Second, the "niche overlap" hypothesis says that individuals who are situated in an area of social space that is covered by multiple niches will be more likely to leave the group than those squarely in the center of the niche because the former are the targets of intergroup competition for membership. Conducting an event-history analysis of association membership data from the Ten Towns Project, a survey of residents of selected Nebraska towns, authors find support for both hypotheses. They argue that their findings do not rely on a rational choice theory, and suggest that these findings are evidence of process of blind evolution, rather than human agency, in structuring social groups.

*Keith G. Provan & H. Brinton Milward, A Preliminary Theory of Interorganizational Network Effectiveness: A Comparative Study of Four Community Mental Health Systems, 40 Administrative Science Quarterly 1 (March 1995)*

Comparative qualitative and quantitative analysis of mental health delivery systems in four U.S. cities is designed to identify explanations for network effectiveness (as measured here by client outcomes). Authors identify four key aspects of network effectiveness. First, network effectiveness is enhanced when the network is integrated, but only when integration occurs through centralization. Networks that are both centrally integrated through a core agency and decentrally integrated through cohesive links among actors will be less effective than those that are predominantly centralized. Centralization through a core agency makes monitoring and control possible, but dual integration appears to create inefficient and unnecessary complexities, leading to uncertainty about where to go for resources. Second, network effectiveness is highest when mechanisms of external control are direct and not fragmented. Authors note that this finding contradicts earlier findings that decentralized fiscal control allows greater flexibility in service delivery, but in their case studies, direct control made it easier for the state to monitor core agency outcomes, and non-fragmented control permitted the core agency to monitor client outcomes at other agencies. Third, network stability is a necessary condition, particularly in mental health networks, in which clients are especially sensitive to uncertainty, and in which networks must be linked fairly tightly to provide necessary services. Fourth, resource munificence is a requirement for networks to achieve high effectiveness. Authors acknowledge that mental health services are costly and ongoing, so that the absence of sufficient resources may require elimination of important services. However, they suggest that other factors such as integration and stability may be more important to assuring that clients are adequately served.

*Keith G. Provan & Juliann G. Sebastian, Networks Within Networks: Service Link Overlap, Organizational Cliques, and Network Effectiveness, 41 Academy of Management Journal 453 (August 1998)*

Responding to the call for greater integration of health and human service provider networks, authors examine the relationship between network structure and client outcomes in three U.S. cities' mental health systems. They find that overall network integration (measured by the percentage of active case coordination and reciprocated referral links used out of all possible links) was a poor predictor of client outcomes. However, "service link overlap"--integration among cliques within the network, such that cliques were linked by both reciprocated referrals and case coordination—were positive predictors of outcomes. Authors suggest that network administrators should perhaps focus on building strong, cooperative integration among cliques of key member firms, rather than loosely integrating the whole network. They explain that, for example, while a homeless person may require a variety of social services, her outcomes are shaped mostly by the clique that meets her primary needs (e.g., food, shelter, health care). If this clique has some cooperative links to other cliques (without there necessarily being a weak link between every firm), ideas developed in one clique can be disseminated throughout the network. Authors suggest that their findings may have implications for R&D links, which appear to develop among cliques of firms working on a common problem.

*Kendall Roth, Managing International Interdependence: CEO Characteristics in a Resource-Based Framework, 38 Academy of Management Journal 200 (February 1995)*

Study tests the general hypothesis that the level of a firm's international interdependence influences the ideal characteristics for that firm's CEO. Because firms that are internationally interdependent must integrate and coordinate widely dispersed resource stocks, the author expects that information-processing capacity is particularly important for CEOs of these firms. Regression and cluster analysis on firm and CEO data for medium-sized firms from nine industries reveals support for hypotheses that a CEO's greater locus of control has a stronger impact on performance amid international interdependence (because a CEO who believes she can control events will spend more effort gathering task-relevant information), and that likewise being a "feeling type" has a greater impact on internationally interdependent firms (because they will be less likely than "thinking types" to neglect others involved in situations requiring high group coordination). However, neither an intuitive character (which would aid one in perceiving an interdependent environment as a whole) nor a generalized functional background (which would give one experience in negotiating interunit interactions) proved significantly more important to the performance of internationally interdependent firms. CEO experience in managing international activities was not significantly more important to performance internationally interdependent firms, but time spent on assignments abroad was. Authors suggest that the experiential aspect of international assignments may allow appreciation for linkages supporting interdependencies.

*Kazuo Yamaguchi, Power in Networks of Substitutable and Complementary Exchange Relations: A Rational-Choice Model and an Analysis of Power Centralization, 61 American Sociological Review 308 (April 1996)*

A rational choice model of individuals' power in substitutable and complementary exchange relations. A modification of Coleman's model of collective action, author's definition says that power depends on the number of exchange partners who are interested in the individual's resource, the extent to which these partners are uninterested or less interested in other actors' resources, the power of the other actors as independent correlates, and the consequences of demand shift under the substitutability/complementarity of relations among the multiple partners. Author tests his theory against previous researchers' results from exchange power experiments on several networks, and finds that the theory rather consistently predicts who is powerful.

Using simulated exchange network data, he derives three sets of hypotheses about power centralization. The first set concerns the effects of substitutability and the distribution of dependent partners (those for whom only one exchange partner exists). He predicts that greater substitutability decreases centralization of power, and increases segmentation of relations by actors' choices. When a relatively greater frequency of dependent partners occurs at the center, power centralization increases, but this effect is mitigated as substitutability increases. A second set of hypotheses deals with the effect of local inequality of centrality. He predicts that larger local inequality of centrality promotes centralization of power, but that this effect is reduced as substitutability increases. The third group of hypotheses centers on the effects of network density and segmentation. Larger global network density and larger relative frequencies of exchange relations at the center promote power centralization, while larger network segmentation decreases it. Author's general hypothesis is that power in an exchange network, as distinguished from a communications network, is determined by both structural factors (network position) and relational factors (complementarity/substitutability of among each actor's exchange relations)

## **B. Empirical Evidence, Theory and Methodology about the Composition of Networks**

### **Summary**

Several researchers provide evidence of the nature of network ties that a particular category of individual is likely to form. Carroll & Teo (1994) develop a theory of the relationship between social ties and the manager's function as bridge to resources. They show that managers are more likely than nonmanagers to include co-workers in social networks, to have discussion networks that contain people who are strangers to one another, and to join clubs and societies. Of particular relevance to technology innovation diffusion are Katz, Tushman & Allen's (1995) findings. They present evidence of a dual ladder promotion path in RD&E units, with one set of supervisors pulling subordinates up the supervisory ladder and another set the technical ladder. If the two groups become increasingly isolated in different networks, the risk is that the firm will find its technical and managerial sides rather disconnected.

Several articles touch on the place of disadvantaged groups in networks. Skvoretz and Fararo (1996) develop a theoretical model to explain how external status might influence interaction within a task group. Mehra, Kilduff & Brass (1998) examine the place of women and minorities in social networks, developing hypotheses that allow them to make distinctions between homophily and negative stereotypes as sources of

network marginality. Schneider, Teske, Roch & Marschall (1997) offer an illustration of network segregation by race and class, showing that minority and poor parents who might have to choose a school for their children have access to lower quality networks of information about schools than do wealthier and white parents.

Finally, Milward & Provan (1998) make a methodological contribution, describing how to calculate several different measures of network integration. The measures are designed for use in a service provider network, though they would probably be adjustable to other contexts.

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*Glenn R. Carroll & Albert C. Teo, On the Social Networks of Managers, 39 Academy of Management Journal 421 (April 1994)*

Using comparison of means and various regression specifications on GSS data, authors compare the core discussion networks and organizational membership networks of managers and nonmanagers. They argue that previous studies have neglected difference in social ties, focusing exclusively on managers' workplace interactions. Their results support first, the hypothesis that managers are more likely to belong to clubs and societies, because these organizations are efficient sources of bridges to the environments for resources. Second, they find that co-workers are more prevalent in managers' core discussion networks than in nonmanagers'. They attribute this result to the unifying effects of the ambiguity and uncertainty of managerial work, mentoring relationships, the loyalty required to maintain managerial political alliances, and some association between managerial skills and relationship-strengthening skills. Third, they find that members of managers' core discussion networks are more likely to be total strangers to one another than members of nonmanagers' networks. They suggest that managers optimize information sharing by cultivating weak ties, and they also point to the importance of co-workers in managers' networks (hypothesis 2), noting that most people's networks consist mainly of relatives, so that co-worker ties would represent less interconnectedness. They find weak support for a fourth hypothesis, that managers' discussion networks are larger—this would logically follow from both the communication skills associated with management and managers' willingness to look beyond relatives for discussion partners. Fifth, they find that managers are more likely to describe themselves as especially close to discussion network members than are nonmanagers; they again point to managers' interpersonal skill, and also to the intimacy that might be expected from long hours with co-workers and sustained interactions with them under stress. A sixth hypothesis is that presence of co-workers in a network is associated with greater job rewards (e.g., salary) for managers, because closer relationships with co-workers will foster better job performance. Oddly, they find that co-workers' presence in the network is associated with greater rewards for nonmanagers, but not for managers. One suggested explanation is that managers who do not form ties with co-workers simply don't retain their management positions for very long.

*Ralph Katz, Michael Tushman, & Thomas J. Allen, The Influence of Supervisory Promotion and Network Location on Subordinate Careers in a Dual Ladder Setting, 41 Management Science 848 (May 1995)*

Longitudinal study of research, development and engineering (RD&E) setting examines the effect of supervisors' promotion paths and network position on career

outcomes for their technical subordinate. Authors hypothesize first (1) that technical subordinates of supervisors promoted managerially will have a higher likelihood of managerial promotion than those whose supervisors are promoted technically, while subordinates of those promoted technically will be more likely to be promoted technically, because supervisors following different promotion paths expose their subordinates to different networks and norms. Further, they predict that (2) technical subordinates with gatekeeping supervisors (those who are strongly networked to both internal and external sources of information) will be more likely to be promoted managerially, because they have greater access to the managerial hierarchy.

Moreover, task characteristics matter. (3A) They predict that the effect of a gatekeeping supervisor on subordinates' promotion to management will be more significant in development than in research or technical service projects. This is because linking to external sources of information is more important in development than in the other types of work. (3B) Similarly, the effect of a supervisor's technical promotion on subordinates' technical promotions is expected to be greater in research than in the other two types of work, because technical supervisors have better connections to professional networks. Finally, (4A) subordinates with gatekeeping supervisors are predicted to have more communication with laboratory and corporate domains, particularly in development projects, (4B) while those with supervisors promoted managerially are expected to have more intraorganizational communication but less external professional communication. Conducting difference-in-proportions tests, authors find support for all of these hypotheses except 4A, and the managerial promotion part of (1).

Authors argue that their results show how barriers might grow between the research and development areas of an RD&E unit. If technical supervisors pull subordinates up one ladder, while gatekeepers follow take their subordinates up another, over time the two groups could become isolated on separated tracks. Furthermore, because those on the management side tend to have more power than those on the technical side, the firm might tend to isolate itself from the technical expertise it possesses.

*Ajay Mehra, Martin Kilduff, & Daniel J. Brass, At the Margins: A Distinctiveness Approach to the Social Identity and Social Networks of Underrepresented Groups, 41 Academy of Management Journal 441 (August 1998)*

Study of homophily by race and gender in networks of MBA students at elite schools. A first set of hypotheses is around distinctiveness. Homophily theory suggests that similar people affiliate, but distinctiveness theory further predicts that characteristics become more salient when they're rarer—e.g., a black woman is more likely to identify with, and form friendships with, other blacks than other women, because women are present in MBA programs in greater numbers. Second, members of underrepresented groups are predicted to be more likely to be marginal in friendship networks, while the tendency to homophily would be negatively associated with centrality for the underrepresented, and positively for majority group members. These hypotheses allow a distinction between two sources of marginality: homophily, and the exclusionary pressures and negative stereotypes that act to preserve the majority in-group's distinctiveness.

The distinctiveness hypotheses were generally supported—minorities were more likely than whites to identify with others and form friendships within race, and women more likely than men to affiliate within sex. Minorities and women did indeed prove to be less central than whites and men respectively (marginally less central in the case of women), and homophily did have a negative effect on centrality for minorities. However, homophily had no significant effect on centrality for women. Authors suggest that minority marginality may be attributable to both exclusionary pressures and distinctiveness-based homophily, while women are marginalized more as a result of exclusionary pressures than of their own choices.

*H. Benton Milward & Keith G. Provan, Measuring Network Structure, 76 Public Administration 387 (Summer 1998)*

Article illustrates techniques for measuring structural relationships between organizations with the help of two network studies, one a comparative analysis of the relationship between four mental health systems' networks and their performance, and the other a small consulting project designed to help a local prevention partnership create linkages. They suggest that one can map a service implementation network by asking agency informants to identify the nature of their involvement with each of the other agencies—referrals sent, referrals received, case coordination, joint programs, service contracts. Linkages are then validated by interviewing at least one other agency respondent, and discussing and resolving discrepancies in opinions. Authors then construct matrices to reflect each agency's connection to each other agency. Using these, they assess integration with two measures. The organizational links score indicates breadth of involvement—it is the total organizational links (organizations who are connected by any of the involvements described above) as a percentage of the maximum possible number. The cooperative links measure gauges depth of involvement by aggregating agency-level scores for the three types of integration that involve active cooperation (case coordination, joint programs, and reciprocated referrals) and dividing by the maximum possible network score. These measures also permit analysis of the structure of integration. Authors compute them two ways, first for the network in its entirety and then only for ties to the core agency. These allow researchers to make a distinction between centralized and decentralized integration. Fully integrated systems will tend to score high on both measures, while those that are integrated with the core agency but not with one another would only score high on the centralized integration measure. See Provan articles in the previous section for application of these measures to the four mental health systems.

*Mark Schneider, Paul Teske, Christine Roch, & Melissa Marschall, Networks to Nowhere: Segregation and Stratification in Networks of Information about Schools, 41 American Journal of Political Science 1201 (October 1997)*

Study of parents' networks of information about schools examines differences in the quality of those networks. Authors use as indicators of network quality: (1) the number of discussants; (2) the strength of ties linking discussants and respondents (with weak ties being better, on a "strength of weak ties" theory that new information will span different networks through weak ties); and (3) the education level of the discussant. They hypothesize that networks will be better in choice districts because incentives to gather

information are better. They also predict that class stratification and racial segregation will influence network structure, hypothesizing specifically that network quality will increase with parental education levels, that the network quality/education link will be stronger in choice districts, that networks will be segregated by race, and that segregation will be greater in choice districts. Hypotheses are tested with a two-stage GLS to predict discussant quality and racial patterns while controlling for nonrandom assignment inherent in different levels of parental involvement in school choice. Results indicate that high SES individuals have higher quality networks, that education networks are highly segregated, and that the incentive of choice does not generally affect network quality, but that where effects are present, networks in choice districts seem to be more highly stratified by class and race.

*John Skvoretz & Thomas J. Fararo, Status and Participation in Task Groups: A Dynamic Network Model, 101 American Journal of Sociology 1366 (March 1996)*

Authors present an “E-state structuralism” dynamic model to describe the relationship between external social status of small task group members and the formation of status order within the task group (for example, the role of gender in the deliberation of a male and female jury). The model draws on ideas of diffuse status and behavior interchange, the mapping of expectation states to action probabilities, and a general model combining social networks with expectation states. Within the model, individuals start equal and ties are stable. When  $x$  addresses  $y$ , there is a parameter specifying probability that diffuse status will be activated (in which case  $x$  automatically gets higher status), and another parameter specifying the probability that this action will lead  $y$  to see  $x$  as higher status. The model also provides for bystanders, who do not take external status into account, but who may also probabilistically make the interpretation that  $x$  takes precedence over  $y$ . A simulation illustrates a few important results of the model. First, the emergence of hierarchies depends strongly on bystanders’ attending to interactions and making their own behavior pattern interpretations. Second, voluble actors—those who participate early and often—are significantly more likely to participate once the status order has stabilized, mainly because early participation leads to higher internal rank. Third, with most parameters tested, participation tends to be relatively equal, but a strong tendency to attribute internal rank to external status tends to make it less equal.

### **C. THE MERITS OF STRONG VS. WEAK TIES**

#### **Summary**

Many articles analyze the roles and the relative merits of strong and weak ties in network performance. At least some of these have important implications in the technical innovation diffusion context. Hansen (1999) suggests that the nature of information matters in determining whether strong or weak ties are optimal. If knowledge is highly codified and independent, weak ties will transmit it faster, but more complex technical knowledge requires multiple interactions to allow for elaborated instructions and feedback. Kraatz (1998) provides evidence that strong ties may be more beneficial in promoting social learning when adaptation of the core to environmental change is necessary. This is because organizations making risky and controversial changes need

not information about options but detailed information from trusted sources. Ashman, Brown & Zwick (1998) argue that both strong and weak ties are important in developing civil society resource organizations, that strong ties with influential leaders increase their legitimacy while weak ties with donors, customers, and investors help them to secure the resources they need. Some of this theory might be applicable to those trying to build an interstate technology network.

Several papers focus on the role of strong ties in exchange networks. Uzzi (1996 & 1997) defines a paradox of embeddedness, demonstrating that strong ties can be efficient because they permit firms to make objectively risky transactions with one another with less hostage taking and information gathering. On the other hand, an organization with too many strong ties will have few resources to readjust itself if the network's structure suddenly changes. DiMaggio & Louch (1998) point to the importance of strong ties in consumer transactions. They offer evidence that buyers want to purchase within-network when the quality of the good is uncertain or they cannot rely on reputation. Sellers are less likely than buyers to prefer within-network transactions, likely because misunderstandings and opportunism have greater costs within networks.

Huckfeldt, Beck, Dalton & Levine (1995) offer more of a strength-of-weak-ties argument. They show that citizens with few weak ties discussants were more likely to be out of touch with public opinion surrounding the 1992 election. They characterize the social network as serving as a micro filter on the macro flow of political information, with the dense filter of a strong ties-only network allowing little of this information to flow through.

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*Darcy Ashman, L. David Brown, & Elizabeth Zwick, The Strength of Strong and Weak Ties: Building Social Capital for the Formation and Governance of Civil Society Resource Organizations, 9 Nonprofit Management and Leadership 153 (Winter 1998)*

Comparative case studies on the founding and governance of eight civil society resource-providing organizations in Africa, Asia and Latin America considers how social capital is created in the development of these organizations. Authors argue that founders should build social capital by both strengthening relationships with existing constituencies and creating new relationships to compensate for the limitations inherent in their particular set of ties. Founders in strong-tie networks must develop and extend ties with potential funding partners—donors, investors, customers. Founders in weak-tie networks should strengthen connection to influential leaders in their domestic societies, so that they gain the legitimacy necessary to validate their roles.

Founders seeking weak ties generally pursued two strategies: create the organization first and then bring in new relationships when additional resources are needed, or include partners who control many resources in the founding. Founders taking the first tack faced more pressure to mobilize resources, but had less difficulty managing internal conflict, because they did not face founding agreements with international donors that limited their flexibility.

*Paul DiMaggio & Hugh Louch, Socially Embedded Consumer Transactions: For What Kinds of Purchases Do People Most Often Use Networks? 63 American Sociological Review 619 (October 1998)*

Authors analyze when consumers choose to make significant purchases from people with whom they have noncommercial relationships. They describe buyers' seeking out embeddedness as a response to transactions that pose a high degree of risk. They hypothesize that consumers will be more likely to make within-network purchases when: (1) the seller relies less on commercial reputation and repeat business; or (2) the quality of the good or service is uncertain. They also hypothesize that those who transact within-network are more likely to be satisfied with the product or service. However, they expect that seller will be less likely than buyers to prefer within-network transactions, because misunderstandings and opportunism can lead to greater costs within one's own network. Authors test these hypotheses using paired t-tests on both behavioral (who did I purchase from) and preference (who would I like to purchase from) survey data. Behavioral data supported (1), and provided weak support for (2), while the reverse is true for preference data. Moreover, they find that purchasers are more likely to report satisfaction, and particularly less likely to report dissatisfaction, when purchasing within network. Preference data strongly supports the hypothesis that buyers are more likely than sellers to prefer within-network transactions, and also indicate that a seller would be (slightly) more likely to tell a friend than a stranger buying a car from them about the car's transmission problems.

*Scott L. Feld & William C. Carter, When Desegregation Reduces Interracial Contact: A Class Size Paradox for Weak Ties, 103 American Journal of Sociology 1165 (March 1998)*

Authors make a theoretical argument that school desegregation policies, designed to increase interracial contact, may actually reduce opportunities for such contact. Arguing for the importance of the strength of interracial weak ties, they note that weak ties between blacks and whites may be particularly significant for social systems in which interracial connections are scarce. Moreover, weak ties developed in schools make important contributions to the overall set of weak ties, because early experience in interracial contexts increases the odds that blacks will continue to interact interracially and develop further such contacts in later life.

To illustrate how desegregation can reduce interracial contact, they start by defining the potential for interracial contact in terms of the number of interracial pairs in each school. In their example, there are initially 300 whites and 100 blacks in school 1, and 200 whites each in schools 2 through 4, for a total of 30,000 interracial pairs. If students were reallocated to as to equalize interracial proportions among the schools, the number of interracial pairs will drop by 16%, even though the policy reduces the number of one-race schools. Authors argue that the desegregation paradox is one of a family of class size paradoxes, in which the average size of the subgroups is mathematically different from the average experienced subgroup size. For example, if a university has two courses with enrollments of 110 and 10, the average class size is 55, but the average experienced class size is 91.8. Authors go on to demonstrate mathematically that the average number of whites sharing a school with blacks is maximized when the absolute difference between the two groups is the same in each school.

From this analysis, they draw the conclusion that increasing the potential for interracial contact should be considered separately from other goals of desegregation. More broadly, they suggest that analysts of weak ties consider how numbers of ties

increase in response to a greater number of opportunities. In-group ties do not necessarily come at the expense of out-group ties if there are conditions that could increase the overall number of ties. However, they add a caveat that their conclusions might not apply if strong ties are what is relevant (if we want interracial friendships, not just contact) and people are capable of forming only a fixed number of strong ties; or if strong ties become less likely in the context of more same-race opportunities.

*Kenneth A. Frank & Jeffrey Y. Yasumoto, Linking Action to Social Structure within a System: Social Capital within and between Subgroups, 104 American Journal of Sociology 642 (November 1998)*

Clustering and multidimensional scaling model of the social structure of the French financial elite, incorporated into multilevel models of directed action, is designed to explain how rational actors balance the demands of ties within their subgroups with diversified ties outside these subgroups. Authors attempt to extend Granovetter's emphasis on economic action as embedded in social contexts by arguing that social contexts, and therefore actions, vary within systems. In a system of dense social ties within cohesive subgroups, actors will be more likely to pursue social capital through enforceable trust, whereas sparse ties will likely lead them to enter transactions of delayed reciprocity, and to rely on systemic norms to ensure the reciprocity. More specifically, they hypothesize, and establish through data analysis, that individuals will be less likely to engage in hostile actions against members of their own subgroups than non-members, because they are constrained by enforced trust. Further, the absence of trust enforcement outside one's own subgroup means that reciprocity is required for support, so they also demonstrate that actors are more likely to engage in supportive actions towards non-members, in order to generate social capital with the supported group member.

*Morten T. Hansen, The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge Across Organization Subunits, 44 Administrative Science Quarterly 82 (March 1999)*

Author combines the concepts of weak ties and complex knowledge to explain the role of weak ties in knowledge sharing around new product development within a multiunit organization. In search theory, weak ties are seen as beneficial because they tend to be non-redundant; moreover, maintaining strong ties is more costly, and more binding because well-established teams are less likely to search outside their contacts. In social network theory, it's assumed that there's no cost to transferring information. However, in product innovation, it is recognized that complex knowledge is difficult to transfer, so that the source unit must be willing and able to transmit it. Complex knowledge is knowledge that is dependent on other components and is not highly codified. Strong ties may be most suited to complex knowledge transfer because the transfer requires multiple interactions for instruction and feedback.

Combining the search and transfer theories, author formulates two hypotheses about the role of weak ties within a multiunit organization. First, the weaker the interunit ties, the shorter the completion time for transferring knowledge when that knowledge is highly codified and independent. Second, the weaker the interunit ties, the longer the completion time when the knowledge is highly non-codified and dependent. A hazard

rate model analysis reveals support for both hypotheses. Thus it appears that the net effect of tie strength on project completion time depends on the complexity of the knowledge being transferred. Also, author's analysis indicates that the effect of weak ties on non-complex knowledge remains significant even when redundancy is controlled for, suggesting that the benefits of weak ties stem not from their non-redundancy but from their lower cost.

*Robert Huckfeldt, Paul Allen Beck, Russell J. Dalton, & Jeffrey Levine, Political Environments, Cohesive Social Groups, and the Communication of Public Opinion, 39 American Journal of Political Science 1025 (November 1995)*

Study of a 1992 election survey offers a theory of political communication stressing the importance of weak-ties citizen discussion for the dissemination of public opinion. Authors hypothesize that if the social communication of political information is bounded by strong ties, we should expect the social flow of political information (in this case, perceived levels of support for Clinton and Bush) to be independent of the distribution of public opinion in the larger environment, whereas it should reflect this distribution if communications extend beyond cohesive groups. They find support for these hypotheses, concluding that the social network serves as a micro filter on the macro flow of political information. They argue that their findings call into question the argument that the collapse of intermediary institutions leaves isolated citizens vulnerable to political manipulation. Given that the most highly educated and organizationally involved citizens are likely to be the ones with weak ties, it appears that the danger to the least politically informed is that they will be cut off from mass public opinion altogether by their lack of weak ties, not left more vulnerable to it.

*Matthew S. Kraatz, Learning By Association? Interorganizational Networks and Adaptation to Environmental Change, 41 Academy of Management Journal 621 (December 1998)*

Study of professional program adoption at 230 private colleges focuses on role that strong ties play in reducing environmental uncertainty and promoting social learning. Author suggests that strong ties are more important than weak in facilitating adaptation of core features to environmental change because those contemplating risky and controversial core changes are more likely to benefit from cooperative interaction and dialogue—they don't need awareness and change options as much as detailed information from trusted sources. Hypothesizes that smaller, more homogeneous, and older (all proxies for strength) networks will be more likely to adapt core features in response to environmental change. Findings generally support the strength of strong ties hypotheses.

Also explores pattern of imitation within network. Broadly, he hypothesizes that organizations will adopt the most frequent response of their network contacts. More specifically, he suggests the following possible patterns: bandwagon imitation (follow the largest organization), status-driven imitation (follow the most prestigious), and social learning (follow the most successful responses, or the most similar organization, imitate when your own performance is substandard). He emphasizes the social learning hypotheses, suggesting that stable social relationships mitigate bandwagon and status

pressures. Indeed results support the social learning hypotheses, but not the other two imitation theories.

*James D. Montgomery, Weak Ties, Employment, and Inequality: An Equilibrium Analysis, 99 American Journal of Sociology 1212 (March 1994)*

Author presents model with a simple social structure with two-person dyads and a pattern of social interaction –permanent interaction with the strong tie, combined with random, temporary interaction with weak ties—to a Markov model of employment transitions, in order to illustrate the effects of changes in weak-tie interactions on efficiency and distributional concerns. The model is designed to evaluate Granovetter’s conjectures that replacement of weak ties by strong ties will lead to a lower employment rate and a less equitable distribution of employment. Author finds that increasing weak-tie interactions always has a positive distributional effect, provided that inbreeding by employment status among weak ties is low, and that increasing weak-tie interactions also raises the steady-state employment rate.

*Brian Uzzi, The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect, 61 American Sociological Review 674 (August 1996)*

Ethnographic study of apparel firms develops a formulation to explain how embeddedness and network structure influence economic action. Embedded ties were found to be characterized by: (1) trust, which insulated against opportunism, and so facilitated the exchange of difficult-to-value resources and information; (2) fine-grained transfer of information—strategic and tacit knowledge that gained its reliability and meaning in part from the identity of its provider; and (3) joint problem-solving arrangements—actors were able to exchange direct feedback and work out problems “on the fly.” Thus the ethnographic findings suggested that the embeddedness could equal or surpass market alternatives by reducing the costs of monitoring in exchange, quickening decision-making, and promoting organizational learning.

A second stage of the research generates hypotheses and tests them against ILGWU data on exchanges between apparel contractors and managers. Author hypothesize that organizations increase their probability of survival by: (1) being tied to network partners with embedded, as opposed to arm’s length, ties; (2) by linking to an embedded-ties business group network; and (3) by tending towards an integrated network consisting of both embedded and arm’s length ties. The argument for this final hypothesis is that balanced networks can get the benefits of trust, joint problem solving, etc., while at the same time gaining wide access to information circulating in the market, as well as potential new trading partners. He indeed finds a U-shaped effect of arm’s length vs. embedded ties on failure probability.

*Brian Uzzi, Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness, 42 Administrative Science Quarterly 35 (March 1997)*

Based on his ethnographic study of apparel manufacturers, author offers detailed propositions about the functions and effects of embedded ties. First, embedded ties generate economies of time because they reduce the need to protect against opportunism when contracting, and because they permit fine-grained information transfer. Second,

embedded ties influence search behavior, permitting actors to reveal interests that could not easily be communicated across market ties, and to negotiate outcomes that benefit both sides of the transaction—they make “deeper” search and positive-sum solutions possible. Third, by allowing actors to rely on reciprocity, embedded ties reduce transactions’ risk, and: permit the firms to make objectively more risky investments and devote fewer resources to hostage taking. Network forms are expected to dominate when competitive advantage depends on the ability to reduce product development or investment risk. Fourth, embedded ties generate Pareto improvements in the allocation of resources, because actors are more willing to reveal critical information about their interests and needs.

However, there are also potential drawbacks to embeddedness. Adaptation becomes more difficult when network relationships are finely tuned to specific trading partners, and exchange with a few embedded ties reduces access to information about new opportunities. Authors suggests three instances in which organizations are particularly vulnerable to embeddedness: (1) when a core network player makes an unforeseeable exit; (2) when institutional forces rationalize markets (e.g., conglomerates’ purchase of manufacturer prompts shift to “numbers buying” rather than “relationship buying”); and (3) overembeddedness of the network as a whole ossifies the organization, either isolating it from innovative ideas or turning it into a “relief organization” for struggling firms in the network. Thus the paradox of embedded ties is that the same processes that create a good fit with the present environment can prevent the organization from adapting to future environments.

#### **D. TRUST THEORY**

*Ranjay Gulati, Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances, 38 Academy of Management Journal 85 (February 1995)*

Author draws on both transaction cost analysis and sociological theory to develop the role of interfirm trust in repeated alliances, and test them using logistic regression on CATI data. Noting that transaction cost theorists have pointed to the high transaction cost burden of R&D alliances, he hypothesizes that alliances with an R&D component are more likely than other alliances to be equity-based, because shared equity aligns partners’ interests and deters opportunistic behavior. However, he suggests that sociological theory of trust can explain differences in governance structure between repeated and non-repeated alliances. He hypothesizes (1) that the greater the number of previous alliances, the less likely the relationship is to be equity-based—because trust makes opportunism-detering equity less necessary. Second, he suggests that the nature of previous alliances affects the character of the new alliance—hypothesizing (2a) that a greater number of previous equity alliances decreases the likelihood of an equity-based alliances, because these are more likely than non-equity to involve prolonged close interactions, which promote mutual awareness. (2b) Previous non-equity alliances are also expected to promote mutual awareness (and therefore future non-equity alliances) but to a lesser degree than a history of equity-based alliances. (3) Alliances are hypothesized to be more likely to be equity-based if they are among firms of different nations, because information is better and the costs of opportunism greater in the

domestic context. (4) Alliances are expected to be more likely to be equity-based if they are among more than two firms, because the possibility of stalemate and dysfunctional behavior is greater. All hypotheses were supported except (2b) and (4). Author concludes that explanations of the nature of alliance contracts should encompass both transaction costs and social factors.

*Peter Kollock, The Emergence of Exchange Structures: An Experimental Study of Uncertainty, Commitment, and Trust, 100 American Journal of Sociology 313 (September 1994)*

Author hypothesizes that uncertainty affects actors' choice of strategies of exchange, and therefore the exchange networks that emerge. If uncertainty is high, actors will choose exchange relations with actors who have already proved trustworthy. In this exchange network, trust will be high, actors concerned with their reputation, and the network as a whole marked by long-term, personalized relations. However, if uncertainty is low, actors will be less concerned about exchange relations, and trust will be lower. He conducts two sets of exchange experiments (with each subject given a choice of several exchange partners), one in which the buyer is certain about the good's quality, and one with an uncertain-quality good. He finds that in uncertainty conditions: (1) commitment (not shifting to another exchange partner) was greater; (2) subjects were more likely to be concerned about their own and their partners' reputations; (3) subjects were more likely to report staying with an exchange partner even when they could get a better price from someone else; and (4) subjects who made a successful exchange rated their partners as significantly more trustworthy. Author concludes that the experiments demonstrate that social exchange theory should recognize the effects of deceit and opportunism on exchange, and should investigate how social structure emerges rather than simply focusing on its effects.

*M. Audrey Korsgaard, David M. Schweiger, Harry J. Sapienza, Building Commitment, Attachment, and Trust in Strategic Decision-Making Teams: The Role of Procedural Justice, 38 Academy of Management Journal 60 (February 1995)*

Study of management teams (using analysis of means and variance, repeated measures analysis) examines how decision-making procedures can generate or fail to generate positive attitudes that facilitate cooperation. First, authors find that members whose input was considered perceived decisions as more fair than those whose input was not. The find weak support for the proposition that the effect of this consideration is stronger when the members have weaker direct influence over the decision. Similarly, evidence suggests that team leaders' consideration of their input is positively associated with member commitment to the decision, and that consideration has a stronger impact on commitment when member influence is low. Consideration of member input also has a positive effect on members' attachment to the team and their trust in the leader. Finally, perceptions of the decision's procedural fairness mediate the impact of consideration and the consideration-influence interaction on commitment to the decision and attachment to the group, though there is no significant mediation effect on trust in the team leader.

*Edward J. Lawler & Jeongkoo Yoon, Commitment in Exchange Relations: A Test of Cohesion, 61 American Sociological Review 89 (February 1996)*

Authors offer a theory of relational cohesion to explain how and when members of dyads in a network who are instrumentally committed to an exchange become emotionally committed to the relationship. First, structural cohesion is high when each actor is more likely to benefit from a negotiated exchange in this dyad than from another negotiated exchange. Under authors' model, structural cohesion is likely to be high when: (1) the actors have equal power (because within the dyad, an increase in A's power tends to decrease B's); and (2) the dyad's total power is high. Exchange frequency is a positive linear function of structural cohesion, and positive emotion is a positive linear function of exchange frequency. Strong positive emotions will tend to make the relation salient as a target of attachment and commitment. Once an emotional commitment exists in the relationship, authors predict the following three behaviors: (1) unilaterally providing gifts to one another; (2) staying in the relation when good alternatives exist; and (3) contributing to a joint venture in which individual and collective interests do not coincide.

Authors conducted OLS regression on a series of two-party negotiation experiments; following the negotiations, parties were given opportunity to engage in one of the three behaviors described above (i.e., giving one another gifts, staying in a partnership despite an alternative, and contributing to a joint account). They found that higher total power and higher relative power were associated with a greater frequency of agreement in the negotiations (parties had multiple rounds of negotiations). Moreover, frequency of agreement had a strong positive effect on positive emotion, positive emotion had a positive effect on parties' description of their cohesion, and cohesion was a positive predictor of the three behaviors. Authors suggest that relational cohesion becomes a source of embeddedness, generating informal constraints on opportunism and increasing the opportunity costs of switching to alternatives. The affective component makes long-term horizontal contracting more viable than transaction-cost theory implies.

*Edward J. Lawler & Jeongkoo Yoon, Network Structure and Emotion in Exchange Relations, 63 American Sociological Review 871 (December 1998)*

Authors present several hypotheses about the effects of cohesive (emotional) social relations on network exchange. First, the impact of exchange frequency on positive emotions, of positive emotions on relational cohesion, and of cohesion on commitment behavior (see above article) will be stronger in equal power relations than in unequal (specifically, they compare stem and branch networks when hypothesizing about equality and inequality). Another set of hypotheses concerns group identity effects. Group identity theory says that a strong sense of group can activate egalitarian norms that diminish differentiation within exchange relations. Specifically, they predict that the dyadic cohesion effect should be weaker when an overarching group identity is present than when it is not, and that network members with unequal power will make exchanges that yield smaller profit differences when a group identity is present.

A negotiation experiment tests the hypotheses. Authors find, as predicted, that cohesion develops in equal-power relations, but not in unequal. Group identity does reduce the profit differential between dyads with unequal power, but it does not appear to influence the strength of dyad cohesion. They argue that cohesive pockets are more

likely to arise in equal-power than unequal-power networks because of good feelings that tend to arise from successful exchanges among equal-power dyads.

*Daniel J. McAllister, Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations, 38 Academy of Management Journal 24 (February 1995)*

Two-stage structural equation path analysis of manager-peer dyad data presents a model of the causes and consequences of trust. A central distinction in the model is between cognition-based trust (“reliableness”) and emotion-based trust (“faith” or “emotional trust”). Analysis supports the hypothesis that they are two distinct dimensions of interpersonal trust among managers. Author hypothesizes that cognition-based trust of a peer is positively associated with the peer’s reliable role performance, ethnic or cultural similarity to the manager, and professional credentials. Affect-based trust is expected to stem from the peer’s citizenship paper (helping the manager in ways that fall outside the peer’s work role) and the frequency of interaction between peer and manager. The predictions on causes of affect-based trust were strongly supported, but there was no significant positive association between cognition-based trust and any of the three proposed causes.

Author also considers the relationship between the two forms of trust and their consequences. He finds a strong positive relationship between the two forms of trust. He raises but does not test hypotheses that cognition-based trust reduces the extent to which the manager engages in control-based monitoring of the peer and the manager’s defensive behavior toward the peer. He finds support for the hypotheses that affect-based trust is positively associated with both the extent to which the manager monitors the peer’s needs and the amount of citizenship behavior directed from the manager to the peer. He also finds evidence that the manager’s level of needs-based monitoring of, and citizenship behavior towards, the peer is positively associated with performance evaluations for the manager, but he does not find any positive association between these and the peer’s performance. He concludes that understanding the affective and expressive qualities of work relationships is critical to explaining how managers and other workers coordinate action in organizations.

*S. Wojciech Sokolowski, Innovation, Professional Interests, and Nonprofit Organizations: The Case of Health Care in Poland, 8 Nonprofit Management and Leadership 363 (Summer 1998)*

Author argues that nonprofits have a special role to play in spreading technological innovation. His model seeks to explain the increasing presence of nonprofits in health care delivery in Poland despite the field’s dominance by public and private providers, as well as the substantial influx of health professionals into nonprofit organizations, despite the fact that growing opportunities in the private sector pay better. Using interview data, author determines that professionals channel more innovative forms of service provision (e.g., new treatments for Alzheimer’s, herbal therapy) through the nonprofit form rather than offering them in the private or public sectors. Author concludes that nonprofit organizations embed transaction between actors facing an information asymmetry because the nonprofit form creates a set of expectations that define the innovative, controversial service as a public benefit.

## E. SOCIAL CAPITAL

*Maura A. Belliveau, Charles A. O'Reilly III, & James B. Wade, Social Capital at the Top: Effects of Social Similarity and Status on CEO Compensation, 39 Academy of Management Journal 1568 (December 1996)*

OLS regression analyses of CEO/compensation committee chair dyads are designed to test the social influence perspective that CEOs can enhance their compensation by using social network and elite institution resources. Author do not find support for hypotheses that high social similarity between CEO and compensation committee chair, or the CEO's high social status are positively associated with CEO compensation levels. Rather, it is the relative positions of the two that seem to matter. They find that compensation committee chairs who are of higher social status than their CEOs tend to approve lower compensation, and that CEOs with higher social status than their chairs are able to exact higher compensation. Similarly, the combination of CEOs who are of higher status than other CEOs with chairs who are of lower status than other compensation committee chairs is associated with higher CEO compensation. They suggest that researchers should pay greater attention to the targets of social influence, and their social capital relative to those who seek to influence them.

*Ronald S. Burt, The Contingent Value of Social Capital, 42 Administrative Science Quarterly 339 (June 1997)*

Structural hole theory is used to predict the value of social capital to an individual. Author explains that the structural hole argument defines social capital as the information and control benefits of being the broker between people who are otherwise disconnected in social structure. The information benefits include access, timing, and referrals; a structural hole indicates that information on either side is nonredundant, and permits the manager to filter information through to the right places in the network. Control benefits come from the manager's role as a bridge—she has the opportunity to adjust her image with each contact, and have a large say in whose interests are served through that bridge. Author predicts that managers whose contact networks have many structural holes exercise control over more rewarding opportunities, because they move information faster, monitor it more effectively, and know organizational problems earlier.

He further argues that the value of social capital is dependent on the number of peers a manager has. Having many peers reduces the manager's freedom to define her job because peers form a competitive frame of reference, and because the way in which the job is performed has a legitimacy independent of her. If a manager's work is pre-defined by corporate convention or a supervisor, the information and control benefits that stem from structural holes will not be very valuable because she does not have the flexibility to develop opportunities from these benefits.

To test his theory of social capital, he first uses network and performance data on a probability sample of senior electronics managers to demonstrate the baseline value of social capital. Modeling social capital as low network constraint, and measuring it in terms of network size, density, and hierarchy, he finds a negative association between network constraint and early promotion. Second, he uses data on manufacturing managers to compare managers with different numbers of peers. Regression results reveal that social capital value (here measured as the magnitude of constraint correlation

with promotion) decreases with the manager's number of peers. He also finds that the rate at which peers erode the value of social capital is higher where social capital is most valuable—i.e., among boundary-spanning managers with few peers.

*Stephen S. Cohen & Gary Fields, Social Capital and Capital Gains in Silicon Valley, 41 California Management Review 108 (Winter 1999)*

Authors argue that attempting to apply Putnam's concept of social capital as networks of civic engagement to Silicon Valley would be misguided. They acknowledge that trust is an important part of Silicon Valley collaborations, but they emphasize that the trust is founded in proven performance, not in civic engagement or community, which is in fact quite underdeveloped in Silicon Valley. They point to a dilemma in Putnam's theory—that if the past, the history of trust, reciprocity, and social interaction—is the material on which social capital networks are formed, and if a region has no such history, how are social capital networks created? They suggest that competitive economies come from choices made by economic and political actors to shape institutions so that they guide the market process towards risk-taking and innovation. In the case of Silicon Valley, government and major institutions played a critical role in creating innovative milieus. Stanford University created a research institute to support high-tech firms, opened its engineering classrooms to local companies, and promoted creation of one of the country's first industrial parks. Military funding also supported high-tech start ups, and Stanford's research university/firm partnership model spread to Berkeley and later UCSF. Silicon Valley also benefited from an influx of venture capitalists who, unlike venture capitalists in other parts of the country, had prior careers with high-tech firms, and so were able to grasp the technological side of the business quickly, and to use personal connections with these firms to facilitate innovation and entrepreneurialism. Concluding, authors argue that the performance-focused trust that characterizes Silicon Valley is not simply a cheap substitute for civic engagement, that it may even be preferable, because it is open to outsiders, people from different cultures and with different ideas.

*Johannes M. Pennings, Kyungmook Lee, Arjen van Witteloostuijn, Human Capital, Social Capital, and Firm Dissolution, 41 Academy of Management Journal 425 (August 1998)*

Event history analysis of dissolution of Dutch accounting firms simultaneously examines the effects of human capital and social capital on firm survival. The firm's education-based, industry-specific human capital is hypothesized to affect dissolution negatively, while its human capital developed through experience is expected to have a U-shaped relationship with dissolution (because individuals develop skill at attracting and retaining clients as they gain experience, but they also age and die or retire). Firms' social capital is also expected to be negatively associated with dissolution. The human capital hypotheses are strongly supported, though only two social capital variables—proportion of partners who previously worked in the client environment and proportion of former partners in the client environment, but not the same measures for associates, and not heterogeneity of origins for partners or associates, or heterogeneity of destination for former partners or associates—significantly decreased dissolutions.

Authors also offer more specific predictions about human capital. First, firm-specific human capital and social capital is expected to have a greater negative association with dissolution than industry-specific human and social capital. A client may have a relationship with both the professional serving her, and the firm; if the professional moves to another firm, part, but only part, of that double-tie is lost. Results of chi-squared tests supported this hypothesis for human capital, but showed no significant difference between firm-specific and industry specific social capital. Another prediction was that partners' (owners') human and social capital would have a stronger negative association with dissolution than associates, because (1) owners as residual claimants have a greater incentive to use their capital for firm growth; (2) competition prevents the firm from expropriating associates' marginal product; and (3) owners have higher financial and nonfinancial exit barriers. This hypothesis was partially supported for social capital—having partners from client environments and sending former partners to client environments had significantly stronger effects than the same measures for associates, though there were no significant differences between partners and associates on other measures. These results are seen as supporting the contention that human and social capital influence firm performance, and that when human and social capital are specific and nonappropriable, their influence on firm performance may be greater.

*Priti Pradhan Shah, Who are Employees' Social Referents? Using a Network Perspective to Determine Referent Others, 41 Academy of Management Journal 249 (June 1998)*

QAP regression analysis tests hypotheses about brokerage firm employees' social referents. The central distinction is between cohesive actors (friends) and structurally equivalent actors (those holding the same network position). Cohesive actors supply a greater diversity and quantity of information because of trust, proximity, and frequency of contact. However, structurally equivalent actors possess more valuable information about the individual's role. Because acquiring direct information from them is more difficult, author hypothesizes, and finds support for the hypothesis, that individuals are more likely to monitor structurally equivalent actors than cohesive. Similarly, author finds evidence to support the hypotheses that individuals are more likely to get general organizational information (gossip, norms, culture, office politics) from cohesive actors, and more likely to get job-relevant information from the structurally equivalent (the job-relevant information hypothesis held true for sales assistants and operations staff, though not for brokers). Author also predicts that individuals will compare themselves more to structurally equivalent actors than to cohesive on work-relevant attributes (performance, career progress), both because people hesitate to use friends in work-related comparisons, and the structurally equivalent can provide more relevant information. However, results reveal that individuals in all job categories examined rely significantly on both types for comparison.

*Wenpin Tsai & Sumantra Ghoshal, Social Capital and Value Creation: The Role of Intrafirm Networks, 41 Academy of Management Journal 464 (August 1998)*

Using correlations and the Multiple Regression Quadratic Assignment Procedure on survey data from all business units of an electronics multinational, author analyzes, for intrafirm networks, (1) interrelation of structural (social ties), relational (trusting

relations), and cognitive (value systems) aspects of social capital; (2) how these influence resource combination and exchange; and (3) how resource combination and exchange influence value creation through innovation.

Regression results support hypothesis that centrality of a business unit in an interunit social interaction is positively associated with perceived trustworthiness—that structural and relational are linked; and that shared vision is positively associated with perceived trustworthiness—that relational and cognitive are linked. However, results do not support hypothesis that centrality is positively associated with shared vision—that structural and cognitive are linked. Authors suggest that perhaps firm units can share a strong sense of the firm's vision without sustained interactions with one another. Authors also find that shared vision is not significantly positively associated with extent of resource exchange/combination, but that the structural and relational measures both are. Finally, results support the hypothesis that the level of resource exchange/combination is positively associated with the unit's level of product innovation. Findings suggest that sharing social ties and trust can help firm members to exchange ideas about efficient ways to combine resources, and that this in turn can lead to new products and processes.