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Social Capital as Social Mechanisms and Collective Assets: The Example of Status Auctions among Colleagues

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This chapter describes the way in which the intersection of networks can be a social and informal mechanism that contributes to organizational governance. Specifically, it is about a mechanism that helps the organization deal with potentially negative effects of status competition between members. We identify our main contribution as twofold. First, status competition is examined as an "unbounded" status auction process. Sutton and Hargadon (1996) provided rich descriptions of "bounded" or "segregated"[1] status auctions in design firms; the status auction they describe is confined to the brainstorming room and designated brainstorming sessions. Here, we look at "unbounded" and diffuse status auction in which status displays and challenges occur throughout the organization. When status auctions cannot be confined or segregated from day-to-day operations, they need to be governed in some other way. We report how intersecting kinds of relationships serve that end. In other words, we describe how a specific kind of multiplexity in members' networks provides the social mechanism that helps to deal with the potentially negative effects of such auctions. Second, we use a specific data analysis method that is important to reconstitute this informal governance mechanism, especially because it helps to analyze the substructures of multiplex ties between members on which this mechanism is based.

In organized settings, participation in collective action—for example, team production, regulatory activity, or enforcement of previous agree-

ments—requires cooperation with others, expressed through routine transfers or exchanges of various kinds of resources (Crozier & Friedberg 1977). These resources include information, coworkers' goodwill, advice, sometimes emotional support, and many other means that serve individual and collective ends. From a structural perspective, this means that specific local (uniplex or multiplex) substructures of social ties must be organized so that members can cooperate and exchange on an ongoing basis in the context of wider collective actors such as organizations.

These various kinds of resources and social ties have often been seen as constituting individual social capital for individual attainment. In this chapter, we do not focus on measuring the relative contribution of such social ties (and their structure) to maximization of individual performance in competitive arenas (Burt 1992). We are instead largely concerned with how members manage their social resources in order to fulfill their commitment to a broadly understood labor contract. This requires an understanding of the concept of social capital as a collective asset, encompassing any social mechanism that can characterize and help a corporate actor solve governance problems.

Citing Stinchcombe (1991:367), Hedstrom and Swedberg (1998) provide the following definition of a social mechanism: "Mechanisms in a theory are defined as bits of theory about entities at a different level (e.g., individuals) than the main entities being theorized about (e.g., groups), which help to make the higher-level theory more supple, more accurate, or more general." A social mechanism is thus intrinsically multilevel. Following this definition, we also believe that, like in the now well-established network approach to social capital, such mechanisms can be observed only through an analysis of social networks of members' ties within organizations. Recurring structural and substructural patterns of uniplex or multiplex ties are assumed to be beneficial to collective action because they solve problems of coordination, as well as problems of individual action (for instance, by reducing individual transaction costs or improving chances of getting ahead).

Here we identify one such governance mechanism in a collegial, "knowledge-intensive" organization (Lazega 1992b forthcoming; Starbuck 1992; Waters 1989). We describe a "locally multiplex" exchange system, with a specific pattern of multiplex ties among members, which suggests the presence of this mechanism that helps members both to encourage status auctions and keep them under control. In other words, it both cultivates and mitigates status competition among colleagues working together, thus solving a "too many cooks" problem. Technically, this notion of exchange pattern refers to dyadic, triadic, and higher-level substructures that reveal the social mechanism based on collective management of multiple resources.

Using a case study, a network study of a corporate law firm, we look at how three important production-related resources (co-workers' goodwill, advice, and friendship) are transferred and exchanged by members. Specifically, we analyze the interlocking of ties among members and define a limited number of expected interdependencies among such ties. We argue that regularities in these substructures contribute to the social capital of the firm by creating typical transfers and exchanges and, as such, provide a structural answer to the problem of their participation in collective action. These regularities constitute a social mechanism that serves to control professional status auctions.

In order to appreciate the role of these substructures in the governance mechanism, it is helpful to understand the work process typical of professional members in this organization, as well as the resources that interdependent individuals need to carry it out (Crozier & Friedberg 1977). The firm is decomposed into small, flexible, and heterogeneous task forces (Lazega 1992a) that must be able to cooperate quickly and efficiently in order to react to complex nonstandardized problems. In this context, such temporary task forces composed of partners and associates (at least one of each) are multifunctional and sometimes multidisciplinary (litigation, corporate). The importance of cooperation in these task forces to effective individual participation is evident from the fact that individual economic performance is positively and significantly associated with task-force membership and constraint (Lazega 1999b). A specific aspect of cooperation in such a collegial firm is that knowledge-intensive work is inextricably mixed with status games (Bourricaud 1961). This type of work in teams of partners and associates is very "deliberative"; it encourages status competition in status auctions (Sutton & Hargadon 1996). But at some point, there is a need for someone, usually the partner in charge, to step in and stop the deliberation. This intervention of hierarchical authority can be damaging among professionals. There is also a need for other members to help mitigate the negative effects of this intervention.

This picture of case-driven task forces thus illustrates why and how a structural approach to cooperation should examine transfers and exchanges of resources central to the functioning of such groups. Here, p^* models (Frank & Strauss 1986; Pattison & Wasserman 1999; Wasserman & Pattison 1996; Robins, Pattison, & Wasserman 1999) are used to bring out this mechanism by analyzing the interplay between the three social resources shaping cooperation among these professionals. After describing the case study in more detail, we briefly describe the model, and then identify the specific local and multiplex exchange substructures that contribute to the organization of this cooperation.

BRAINSTORMS AND STATUS AUCTIONS IN A CORPORATE LAW FIRM

The case study used to establish this approach and describe the kind of relationships minimally involved in this type of cooperation among lawyers can be pictured by a short description of this organization and its functioning. The fieldwork was conducted in 1991 in a Northeastern corporate law firm, which will be called Spencer, Grace & Robbins (SG&R). The firm comprised 71 lawyers in three offices located in three different cities, and included 36 partners and 35 associates. All the lawyers in the firm were interviewed. In Nelson's (1988) terminology, this firm is a "traditional" one, without formally defined departments, as opposed to a more "bureaucratic" type. Interdependence among attorneys working together on a file may be strong for a few weeks, and then weak for months. As a client-oriented, knowledge-intensive organization, it tries to protect its human capital and social resources, such as its network of clients, through the usual policies of commingling partners' assets (clients, experience, innovations; see Gilson & Mnookin 1985) and by the maintenance of an ideology of collegiality. Informal networks of collaboration, advice, and "friendship" (socializing outside work) are key to the integration of the firm (Lazega 1992a).

It is a relatively decentralized organization, which grew out of a merger, but it has no formal and acknowledged distinctions between profit centers. Although not departmentalized, the firm breaks down into two general areas of practice: litigation (half the lawyers of the firm); and "corporate" (anything other than litigation). Sharing work and cross-selling among partners is done mostly on an informal basis. Given the classical stratification of such firms, work is supposed to be channeled to associates through specific partners, but this rule is only partly respected.

A weak administration provides information, but does not have many formal rules to enforce. The firm has an executive committee comprising a managing partner and two deputy managing partners; the executive is elected each year, renewable once, and is selected from partners who are prepared to perform administrative tasks and temporarily transfer some of their clients to other partners. This structure was adopted during the 1980s for more efficient day-to-day management and decision making. The current managing partner is not a "rainmaker" and does not concentrate strong powers in his hands. He is a day-to-day manager who makes recommendations to functional standing committees (finance, associate, marketing, recruitment, etc.) and to the partnership.

Partners' compensation is based exclusively on a seniority lockstep system without any direct link between contribution and returns. The firm goes to great lengths when selecting associates to become partners to take

as few risks as possible and avoid selecting partners who will not "pull their weight." Partners may argue informally about what contribution might "fairly" match one's benefits, but the seniority system mechanically distributes the benefits to each once a year. Great managerial resources are devoted to measurement of each partner's performance (time sheets, billing, collecting, expenses, etc.), and this information is available to the whole partnership. A low performance cannot be hidden for long. Such firms usually make considerable profits, however, and this may help partners overlook the fact that some voluntary contributions to shared benefits may not always be consistent with the successful pursuit of narrow self-interest.

The firm does not have a formal peer review system which could provide an intermediate step between lateral control and formal court procedures. Before expulsion, partners have the power to "punish" each other seriously by preventing a partner from reaching the next seniority level in the compensation system. As mentioned above, a partner can be expelled only if there is near-unanimity against him/her. Buying out a partner is very difficult and costly. Therefore, despite the existence of direct financial controls, the firm does not have many formal ways of dealing with free-loading. The harm that a single partner can inflict on others might become very substantial in the long run. Conversely, partners can try to isolate one of their own informally by, at the very least, not referring clients, not "lending" associates, or not providing information and advice.

In this context, and as mentioned earlier, temporary partner-associate task forces constitute the core of multifunctional and sometimes multidisciplinary (litigation, corporate) teams. Activity is conducted in such temporary teams in which partners keep their autonomy in their negotiation of means and ends, and in which associates are often expected to brainstorm with higher-status members. This creates what Sutton and Hargadon (1996) call *status auctions*, as well as a pseudomarket for strong cooperation between members with similar and different hierarchical statuses. When deliberating about a case, associates and partners often play a temporarily collegial and egalitarian game in which all arguments have equal weight. At some point, however, partners' greater experience, greater skill and judgment, or responsibility to the client, becomes grounds for justifying stopping these exchanges and making a decision about how the case will be handled and how efforts will be allocated. This is often perceived to be autocratic behavior by partners imposing idiosyncratic standards of proper practice on frustrated associates, but the latter rarely say so. They hope to advance to the top of the associate pyramid and to make it to partnership. To partners, having the final word with associates seems an obvious duty as a service provider or as a professional educator. Differences among partners, however, can either be treated as differences in

style or can trigger advice seeking outside the temporary task force; partners whose advice is sought are usually more senior (Lazega 1995; Lazega & Van Duijn 1997).

CULTIVATING AND MITIGATING STATUS COMPETITION

This form of status competition (among associates, between partners and associates, and among partners) is an efficient mechanism for motivating professionals at work. If receiving social approval from peers is one of Weberian value-oriented actors' goals, allocation of this approval through honors and recognition—along with the privileges of rank in the pecking order—is indeed a powerful motivation device. Status can be endlessly challenged, especially on behalf of different conceptions of professionalism. In this firm, status games and conflicts can become personalized by partners puffing themselves up, thus creating a "too many cooks" problem. They can subsequently have negative or destructive effects on learning and the circulation of knowledge and experience (Lazega 1992b, 1995; Lazer & Katz, 2000). Of course, there are always moral exhortations to preserve consensus among peers, but these can remain artificial and rhetorical. Stimulating competition can easily get in the way of cooperation, and professionals know that they can lose control of this process. Status competition is thus a double-edged sword: it is both encouraged and contained.

Status competition creates management problems for professional organizations and firms, because it is always in danger of unraveling (Olson 1965). Economic approaches to labor markets (Frank 1985) assert that incentives such as specific compensation systems take care of the negative effects of status differences. Thus, low performers and low-status members tend to be overcompensated relative to the value they produce, whereas high performers and high-status members tend to be undercompensated relative to the value they produce: they pay a price for being recognized as high-status members. The firm's lockstep system can therefore be considered as a mitigation device for status competition among partners. A large majority of partners supports it because they believe it prevents yearly conflicts among themselves, especially about each member's value to the firm.

Since compensation in this firm is tied to seniority, and since each member's rank in the seniority scale is defined once and for all, status competition loses one of its most dangerous stakes: money. But it is thus refocused on other issues at stake, such as professional reputation and authority in workgroups. For example, partners can put down associates through as-

sociate reviews, which can also be considered humbling rituals, illustrating to associates that there are acceptable limits to challenges to partner status in the work process (Bosk 1979; Nelson 1988; Lazega 1993). The effects of these humbling rituals are softened by comparisons to other associates or by other members who indicate that they would have behaved or handled the case in another way. They nevertheless "underscore the status differences among their ranks" (Bosk 1979:143).

If knowledge-intensive work is inextricably mixed with status games, collegial organizations find themselves in a bind. Status auctions are double-edged. They can be destructive as well as constructive. Collegial firms, therefore, need both to cultivate and mitigate status competition among their professionals. Following Lazega and Van Duijn (1997; Van Duijn 1995; Van Duijn & Snijders 1995), where we were able to verify that status games are sometimes mitigated by friendship ties, we hypothesize that in such a situation, one would expect a social mechanism both to structure the "deliberative" work process and help mitigate such status-competition games. In the next section, we look at the social capital of this firm as a pattern of social ties and provide more specific and testable hypotheses regarding its functional dimension. Specifically, an analysis of the interlocking of ties among members is shown to provide a structural answer to this structural problem.

TOO MANY COOKS? HYPOTHESES ON A TWO-STEP MITIGATION MECHANISM

This picture of case-driven legal task forces suggests that a structural approach to participation in collective action should examine transfers and exchanges of resources central to the functioning of such workgroups and firms, including resources involved in the mitigation of status competition. This statement is consistent with previous literature on cooperation and exchange of various kinds of resources (Bearman 1997; Breiger & Ennis 1997; Burt 1982; Cook 1987, 1990; Coleman 1990; Crozier & Friedberg 1977; Ekeh 1974; Flap, Bulder, & Völker 1998; Galaskiewicz & Marsden 1978; Gouldner 1960; Han & Breiger 1999; Lazega 1994, 1999a; Lazega & Pattison 1999; Lin 1995; Lindenberg 1997; Levi-Strauss 1949). Here, we consider three types of such resources: co-workers' goodwill, advice, and "friendship." As in any organization, there is an unequal distribution of such resources among the members of this firm. Nevertheless, we contend that the interlocking of these resources is structured in such a way that it creates a mechanism for mitigating status competition. The structures can be construed as corporate social capital, contributing to the shaping of cooperation.

Co-workers' Goodwill, Advice, and "Friendship"

The first type of resource is co-workers' commitment to work, or goodwill related to cooperation. In view of the flexibility needed to accommodate clients' needs, given the size and complexity of some files, a good and committed co-worker is an important resource for individual attorneys. As mentioned above, formal structure imposes constraints on the work process. In general, a file (or case) is handled by two lawyers at least, one partner and one associate. Interdependence among attorneys working together on a file may be strong for a few weeks, and then weak for months. Access to work opportunities depends on intake and assignment policies, on which partners rely to try to prevent possible (ethical and business) conflicts among themselves.

Following the philosophy of apprenticeship in the legal profession, partners analyze and decompose a complex problem into several parts, and attribute to each associate working with them and observing this exercise a small part of the tasks they perform (Nelson 1988). Forced cooperation is nevertheless routine for many partners and most associates, but members also give themselves room to maneuver and be strategic in their choices of co-workers. In this structure, partners and associates need one another. In particular, partners may depend on each other for many reasons. They may have the same clients, represent large and complex files. The form of cooperation is thus dictated by the requirements of the market. In addition, one well-known way of keeping a client is to cross-sell services that can be provided by partners of different specialties. Thus, a client who initially needs advice for a specific problem, say buying a shopping mall, will also be offered tax and litigation services by the firm. This increases revenues and helps establish a relationship with the client. Sharing work and cross-selling among partners is done mostly on an informal basis, although less so among lawyers in general when including associates.

Under such organizational and professional rules, members of the firm have two preoccupations: finding interesting work; and getting cooperation from colleagues to carry it out, especially colleagues who are interested in a long term relationship, *and not in taking advantage of them*. Most members want shared work with reasonable people who pull their weight and do not grab all the credit for themselves, especially in successful cases. Thus, individual members' first preoccupation is with building strong, secure, and durable work relationships with others: partners want other well-connected partners and reliable associates; associates want rewarding partners. Strong work ties are a sort of insurance policy. They extend the horizon beyond short-term security.

The second type of resource is advice. SG&R organizes work among ex-

perts who often refer to abstract legal knowledge. The nature of knowledge-intensive work requires accumulation, transfer, and exchange of knowledge and experience. In this context, transfer and exchange of advice among members can be seen as vital, indeed as one of the main reasons for the existence of such knowledge-intensive firms. Members rely constantly on advice from others. Advice can be seen as a product of goodwill, but it is also different from goodwill in the sense that it can be provided by someone who is not a strong co-worker. In law firms of this type, advice is not billed to the advice-seeker. It does not show in lawyers' time sheets or in firm accounts. Advisors cannot claim credit in successful cases. Lawyers who are not assigned to a case may advise, but if they want to claim their share of the credit they would have to become official co-workers on the case. This is accepted only beyond a certain contribution and negotiated with the lawyers already in charge. It is difficult to predict unilaterally when providing advice may become collaboration. To seek advice in such a context of business, career, and symbolic competition is therefore sometimes a delicate operation. In a law firm that structures itself so as to protect and develop its human and social capital (Wilensky 1967; Smigel 1969; Gilson & Mnookin 1985; Nelson 1988), such a resource is particularly vital to individual members. Members see expertise as accumulated by the firm, and they rely constantly on advice from others. Without it, they cannot solve the usually complex legal problems that they handle (Lazega 1995). In sum, members sought out for advice can be considered to be members with high status (Blau 1964).

The third type of resource is friendship, or "role distance," a form of open-ended support that is not related to the tasks themselves. Rather it is a form of "backstage resource," to use Goffman's (1961) idea of a place where actors retreat to create some distance between themselves and their role.[2] We call this support "friendship," and understand it, in a nonromantic way, as a willingness to help in a difficult situation by providing different types of resources, such as socialization, emotional support, information, and a definition of the situation. A friend is considered as a potential source of many resources, for example, help in asserting or renegotiating one's status, in carving out a place for oneself in the group. The importance of this definition of friendship is that it does not assume reciprocity and is not directly connected to the work process itself. Lawyers say that in law firms, such ties tend to be forged among associates of the same class or between associates who went together to the same law school, and last throughout their career.

It might be surprising that friendship ties are proposed as a third type of resource to be considered systematically in a competitive corporate environment. When speaking about the firm in general, many members perceive that there are not many bases other than business for building ties

with others. This underlies discourse about the firm as an "almost exclusively" economic unit.[3] Friendship ties are not needed to drive the work process itself. Even if general discourse on present day collegiality often stresses the contrast between a business-oriented firm and an idealized collegial past, however, members do mix professional and social ties with some selected colleagues in the firm. The partners quoted here speak more of a general atmosphere, not of the existence of selected friendships and personalized relationships in the firm.[4] In general, they consider that, among business heads, sympathizing hearts also mean interference. Therefore, they tend to keep associates at arms' length, and friendship ties with most other partners are often uneasy. But the select few can help accept negative outcomes of status comparisons, and help deal with potential threats.[5]

A Two-Step Social Mechanism

Recall that in this firm, members work in temporary and flexible task forces, at least one partner and one associate form each team. The task force must deal with complicated and novel legal problems for corporate clients. Work is very intense, and interdependence among the members of the task force is very strong while the case is open. Then the team is dissolved, and the members form different task forces with other people to work on other cases. The partners are always in charge, but it is important to keep in mind that this kind of teamwork often requires that associates brainstorm with higher-status members in order to find innovative solutions to complicated legal problems. The interesting aspect of the work is that associates and partners often play a temporarily "collegial" and egalitarian status game in which all arguments have equal weight. A form of professional status competition is deliberately used here to stimulate creativity because it is recognized as a powerful motivation device among professionals. Members seek some form of consensus about their strategy, but there is not always consensus and, at some point, partners stop this deliberation and make a decision about how the case will be handled, "the strategy," and how the efforts will be allocated. Stopping these deliberations without consensus is, however, tricky. Status competition is stimulating, but it can have negative effects. Associates are frustrated, even if they do not say so, and they may withdraw. Other partners, who are all formally equal, may either just grumble and defer to the partner in charge, or decide that there is a need to seek advice from more experienced or more senior partners outside the temporary task force. We understand that members resort to a third party, to an outside authority, as the first step in the mechanism of mitigation of status competition—the mechanism that is part of this firm's social capital. This use of third parties is similar to that of Coleman, Katz, and Men-

zel's physicians who, in a situation of uncertainty, turned to higher-status and authoritative colleagues for more information. This first step is already multiplex: members with work ties turn to someone with whom they have an advice tie. Therefore, if such a mechanism works in this firm, then work ties should be strongly interlocked with advice ties.

The second step in this mitigation process is due to the fact that, in a collegial and rather flat organization, members of the task force can easily turn to several different third parties for advice. In that case, without another step in the mechanism, the problems raised by status competition would simply be transferred to partners of higher status, with the danger of a domino effect. Therefore we argue that the second step of the mechanism consists in bringing in either only one advisor, or different advisors that are themselves connected by a third type of tie, a friendship tie as defined above. Why would status competition be tamed when advisors have a role distance tie with one another? Recall that in the second step of the mechanism, the two advisors are not involved in the case. They are usually higher-status partners in the first place (because one does not seek advice from people "below"), and it is easier for them to deal with status competition among themselves, to defer to one another so as not to jeopardize their valuable friendship ties. It is often said that higher-status members are under more pressure to be consensus-oriented than lower-status members. If this is an acceptable assumption, then advice ties and role distance ties should be strongly interlocked in this system. And in addition, if indeed this mechanism has two steps, then it should also be the case that work ties and role-distance ties are not strongly and directly interlocked. Work is work: among business heads, role-distance ties can mean interference, and many keep their colleagues at arm's length, particularly if they are of different status.

To summarize, with regard to the interlocking of the different types of resources, we can derive the following hypotheses from our previous argument. To structure the work process, interdependence between coworkers' ties and advice ties is expected to be strong in this exchange system. Specifically, members tend to mix work and advice ties so as to bring in status to control the deliberation process. In addition, to mitigate status competition, interdependence between advice ties and friendship ties is expected to be strong in this exchange system. In other words, members tend to mix advice and friendship ties so as to soften the potentially negative effects of status competition.

Finally, given that partners can always have the upper hand over associates in the same task force, and that partners in the same team seek out other, usually more senior, partners outside the task force to sort out status competition among themselves, we can also think that interdependence between co-workers' ties (often mixing partners and associates) and

friendship ties is relatively unlikely: interdependence between strong co-workers' ties and friendship ties will be weak overall. In other words, members tend, in general, to sort their ties so as not to mix work and friend-ship directly. These expectations are evaluated using the p^* class of multi-variate random graph models (Frank & Strauss 1986; Pattison & Wasser-man 1999; Robins, Pattison, & Wasserman, 1999; Strauss & Ikeda 1990; Wasserman & Pattison 1996).

DATA AND ANALYSES

Based on this organizational analysis of resources associated with produc-tion, standard sociometric data were collected in the firm. The name gen-erators used to conduct the network study are presented in Appendix A. As seen above, in this firm, such ties represent channels for various types of resources for each member. The first is the network of strong *work con-tacts*; close co-workers can be relied upon for their cooperation; they pro-vide future work, more desirable work, or access to clients. The second is the network of *advisors*; advisors provide solutions to, or make final deci-sions in, complex problems in a knowledge-intensive organization han-dling sophisticated legal cases. In this law firm, the difference between advisors and co-workers is based on the fact that a partner can seek an-other partner's advice without including the advisor as a coworker in the file at hand (and thus sharing credit). The third network is the role-dis-tance, or *friendship* network, identified as socializing outside work; friends provide many different resources associated with role distance, such as emotional and symbolic support, or a definition of the situation.

In order to evaluate the expectations derived above, it is necessary to formulate a model that permits dependencies among network ties. Such a model makes it possible to characterize the specific forms of interdepen-dence among resources that help members solve the structural problem of collegial organizations, i.e., to mitigate status competition. The p^* class of models was developed specifically for the analysis of tie interdependen-cies. Models within the multivariate p^* class are probability models for multirelational networks (Wasserman & Pattison 1996; Pattison & Wasser-man 1999). In their most general form, p^* models express the probability of an overall multirelational network structure in terms of parameters asso-ciated with particular network substructures. By *substructure*, we mean a specific hypothetical configuration of network ties linking a small set of network members—for instance, a pair of lawyers joined by mutual network ties, or a trio of lawyers, two of whom are linked by mutual advice ties and a third linked by friendship to one of these two. The substructures appearing in the model are determined by the independence assumptions

that one makes: specifically, the substructures are defined by sets of possi-ble ties, each pair of which is assumed to be conditionally dependent, given the remaining ties. (The number of possible ties in a particular substruc-ture is termed the *level* of the substructure.) Pattison and Wasserman (1999) argued that the multivariate Markov assumption permits one to examine many of the forms of interdependence among ties that have been proposed in the network literature. These forms are associated with notions of role-set, exchange, path-dependence, structural position, and actor effects. The multivariate Markov assumption specifies that two possible network ties are conditionally independent, given all remaining ties, unless the pair of possible ties has a lawyer in common. The consequence of this assumption is that multiplex ties and multiplex dyadic and triadic configurations are all potentially critical in modeling the overall network structure.[6]

A presentation of model selection strategy and analyses of the data at the univariate level is presented in a more technical paper published else-where (Lazega & Pattison 1999).[7] Here we only present the final multi-variate p^* model for the three network relations simultaneously. This model allows us to explore interdependencies among the three types of re-lations that can be evaluated at the level of ties, dyads, and triads. If a sub-structure has a large positive parameter in this p^* model, then the presence of the substructure enhances the likelihood of the overall network. This model is homogeneous in the sense of assuming that a relational sub-structure of a given form (e.g., a pair of reciprocal friendship ties, or some particular triadic structure) has a constant effect on the likelihood of the overall network structure and is not dependent on attributes of the par-ticipating nodes. As a result, the model has a single parameter corre-sponding to each possible substructure. Parameters are estimated using pseudolikelihood estimation (Strauss & Ikeda 1990; Pattison & Wasserman 1999). The approximate standard errors that accompany the pseudolikeli-hood estimates are given only for guidance as to likely order of magnitude.

THE COLLEGIAL BLEND OF RELATIONSHIPS:
A TYPICAL PATTERN

The number of possible distinct dyadic and triadic substructures involv-ing three relations is very large. As a result, the class of substructures used to define an initial multivariate p^* model was restricted to dyadic structures of level four or less; triadic structures of level three or less; and the level 4 triadic substructures identified in univariate analyses.[8] The pseudolikeli-hood estimates for parameters in the final model (following a hierarchical elimination) are presented in Table 1. The parameter labeling is indicated in Figure 1. The estimates are organized according to the types of the in-

Table 1. Parameter Estimates for Final Multivariate Model

Co-work		Advice		Friendship	
Parameter	PLE	Parameter	PLE	Parameter	PLE
τ_{15_W}	-3.49 (.25)	τ_{15_A}	-3.46 (.25)	τ_{15_F}	-4.65 (.29)
τ_{11_WW}	4.45 (.47)	τ_{11_AA}	1.33 (.24)	τ_{11_FF}	2.91 (.24)
τ_{12_WW}	0.06 (.01)	τ_{12_AA}	0.06 (.01)	τ_{12_FF}	0.07 (.01)
τ_{13_WW}	-0.04 (.02)	τ_{13_AA}	-0.06 (.01)	τ_{13_FF}	-0.06 (.02)
τ_{14_WW}	0.10 (.02)	τ_{14_AA}	0.06 (.01)	τ_{14_FF}	0.03 (.02)
τ_{9_WWW}	-0.03 (.02)	τ_{9_AAA}	0.28 (.02)	τ_{9_FFF}	0.28 (.02)
τ_{10_WWW}	0.30 (.06)				
τ_{7_WWW}	-0.09 (.02)				
τ_{8_WWW}	-0.06 (.02)				
τ_{3_WWWW}	-0.11 (.02)				
$\tau_{6\_WWWW;W}$	0.21 (.04)				

Co-work and Advice		Co-work and Friendship		Advice and Friendship	
Parameter	PLE	Parameter	PLE	Parameter	PLE
τ_{15_WA}	2.44 (.13)	τ_{15_WF}	0.96 (.17)	τ_{15_AF}	2.42 (.22)
τ_{11_WA}	0.61 (.21)	τ_{22_WF}	0.48 (.18)	τ_{11_AF}	1.30 (.19)
τ_{12_WA}	-0.01 (.01)	τ_{13_FW}	0.01 (.01)	τ_{13_AF}	-0.01 (.01)
τ_{13_WA}	-0.03 (.01)	τ_{13_WF}	-0.00 (.01)	τ_{13_FA}	-0.03 (.01)
τ_{13_AW}	-0.04 (.01)	τ_{14_WF}	-0.01 (.01)	τ_{14_AF}	-0.02 (.01)
τ_{14_AW}	-0.02 (.01)	τ_{11_WFW}	-1.113 (.23)	τ_{11_AAF}	-0.87 (.24)
τ_{11_WAW}	-0.39 (.17)			τ_{11_FAF}	-0.90 (.27)
τ_{11_AAW}	-0.82 (.14)				
τ_{9_AAW}	-0.08 (.02)	$\tau_{9\_W.FW}$	0.07 (.02)	$\tau_{9\_A.F.A}$	0.07 (.02)
τ_{9_AWA}	-0.10 (.02)				
τ_{9_WAA}	-0.12 (.02)				
τ_{9_AWW}	0.13 (.02)	$\tau_{10\_F.FW}$	-0.13 (.02)	$\tau_{10\_AA.F}$	-0.15 (.02)
τ_{9_WAW}	0.18 (.02)			τ_{13_FAF}	-0.07 (.02)
τ_{8_WWA}	0.03 (.01)			τ_{11_AFAF}	1.55 (.45)

Co-work, Advice, and Friendship

Parameter	PLE
τ_{15_AFW}	-1.00 (.21)
$\tau_{11\_W.AF}$	-0.30 (.24)
$\tau_{11\_W.AFW}$	1.51 (.31)

volved in the corresponding configurations. We focus discussion on the structures involving *combinations* of types of tie, noting the implications that they have for the form of interdependence of ties in the firm.[9]

The large number of parameters corresponding to configurations comprising both co-work and advice suggests that co-work and advice ties are distributed in a highly interdependent manner. We note first that the multiplexity parameter (lawyer i sends a duplex tie to lawyer j) is large and positive and suggests that the co-occurrence of the two types of tie is likely;

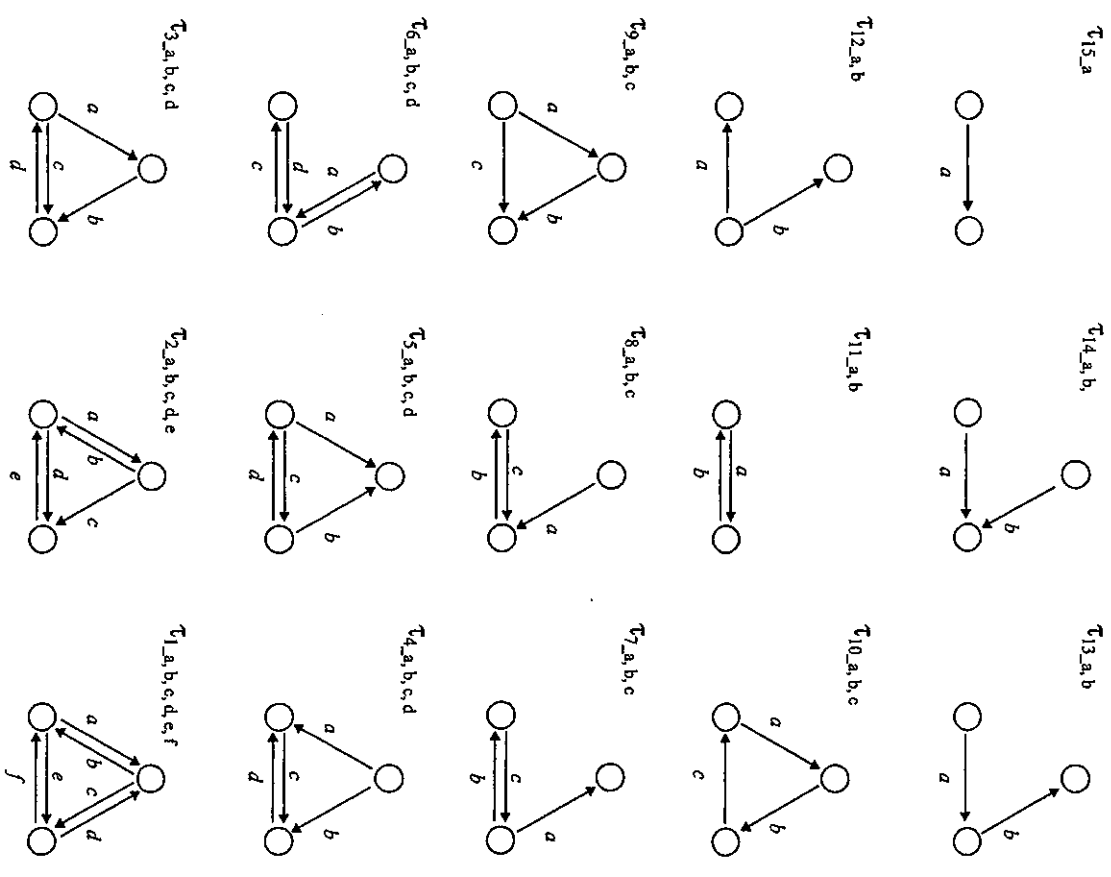Figure 1. Configurations corresponding to p* model parameters. The symbols a, b, c, d, e, and f may refer to any of the uniplex or multiplex relations, namely W (co-work), A (advice), F (friendship), WA (co-work and advice), WF (co-work and friendship), AF (advice and friendship), WAF (co-work, advice, and friendship).

to some degree, co-work and advice are aligned in structure. Second, the exchange parameter (i sends an advice tie to j who reciprocates with a work tie) is also positive, reflecting a tendency for the two types of tie to be exchanged. Third, these tendencies towards alignment and exchange are somewhat disjunctive, as is evident from the negative estimates of the parameters $\tau_{11,WAW}$ and $\tau_{11,A,AW}$. Fourth, there is a clear and interesting form of triadic interdependence for advice and co-work ties: 2-paths comprising one advice and one co-work tie appear to be likely to coincide with a co-work tie, but not with an advice tie. Thus, being a co-worker of an advisor or an advisor of a co-worker is not a sufficient qualification for being a direct advisor. Such indirect ties are more likely to be associated with direct co-worker ties. In this sense, the advice and co-work ties participate in configurations having some of the characteristics of the interlock of strong and weak ties, with advice ties the stronger of the two (Breiger & Pattison 1978; Granovetter 1973; Pattison 1993). It might be hypothesized that advice ties drive the creation of new co-worker ties, in the sense that new co-worker ties may be forged with either the co-workers of one's advisors or the advisors of one's co-workers. Indeed, it is interesting to note that the two triadic advice and co-work configurations with positive parameter estimates contain as substructures two of the few likely co-work forms in which exchange is not evident (namely, $\tau_{12,WW}$ and $\tau_{14,WW}$). One possibility, therefore, is that the advice tie has a stabilizing role in what otherwise may be a less stable pattern of work distribution in a system driven largely by exchange. That is, the lack of exchange in these configurations may be offset against the opportunity to work with individuals at higher status; it is in this sense that status-signaling advice ties are strong and help to articulate the distribution of collective participation. But note that this capacity for work ties to straddle status differences does not extend too far: the advisors of one's advisors are not likely to be co-workers (as the negative estimate for $\tau_{9,A,W}$ indicates). Further, we note that status-signaling advice ties play a role in providing access to work opportunities, and that this may help mitigate against status games. In all, and as expected, the interdependence between co-worker and advice ties is strong in this exchange system. This begins to give shape to the distinctive nature of the exchange mechanism that we consider a form of social capital of the firm.

Advice and friendship ties also exhibit quite strong interdependence, with substantial multiplexity (i sends a duplex tie to j) and exchange (i sends an advice tie to j who reciprocates with a friendship tie) effects. In addition, the positive estimate for $\tau_{11,AF,AF}$ indicates an enhanced reciprocity effect for one type of tie in the presence of a reciprocal tie of the other type; the enhancement is not observed, however, in the presence of an unreciprocated tie of the other type (as the negative estimates for $\tau_{11,FAF}$ and $\tau_{11,A,AF}$ indicate). At the triadic level, the only positive estimate is as-

sociated with a triadic structure in which friendship links the advisors j and k of some lawyer i. Arguably, just as advice ties serve to articulate co-work relations, so friendship ties may serve a weak articulatory role with respect to advice ties (since configurations in which the friend of an advisor is also an advisor have a positive parameter estimate). Negative parameter estimates are associated with 3-cycles comprising two advice ties and a friendship tie (suggesting that even though the advisor of an advisor is a source of potential advice, such a person is unlikely to return a direct friendship tie). Thus, one might argue that the interdependence of advice and friendship ties can be described largely in the dyadic terms of a propensity for multiplexity and exchange, although there is also a weaker articulatory relationship between friendship and advice ties. These patterns of interdependence of friendship and advice ties can also be interpreted as suggesting that friendship "softens" the status differences inhering in advice ties, both directly (through multiplexity and exchange effects) and indirectly (by tending to link the advisors of an individual). Thus, these patterns are consistent with our general expectations regarding the role of role-distance ties in the mitigation of status competition.

As expected, the parameters for configurations involving co-work and friendship tend to be much weaker. The multiplexity and exchange parameters are weak but positive and, since the parameter for the configuration in which a mutual co-work tie occurs in the presence of an asymmetric friendship tie is large and negative, these effects appear to be disjunctive. At the triadic level, cycles comprising two friendship and one co-worker tie are unlikely and there is also a weak tendency for friendship ties to link the two lawyers with whom a third claims co-work ties. This latter effect is similar to, but much weaker than, the pattern by which advice was claimed to help sustain one of the asymmetric co-work configurations. Thus, the members tend to sort their ties so as not to mix work and friendship too directly.

A very small number of dyadic configurations involving co-work, advice, and friendship have large estimated parameters. In particular, the triplex tie from i to j has a negative estimate, whereas the triplex tie accompanied by a reciprocal co-work tie has a positive estimate. This suggests that, even though pairs of lawyers may be linked by duplex ties more commonly than the overall frequency of individual ties would suggest, the observation of all three ties linking a pair is not a common structural form (unless also accompanied by a reciprocal co-work tie).

Finally, simple illustrative counts looking at the number of configurations with both partners and associates in each possible position in the elementary configurations of the auction process, are very helpful with respect to our main argument.[10] They confirm that the brainstorming overwhelmingly directs requests for advice toward partners (75 percent of cor-

responding triads), and that friendship ties in this context are mostly between advising partners (62 percent of corresponding triads). The status competition process and its mitigation through a specific pattern blending various sorts of ties among members are thus realistically anchored in the established formal structure of the organization.

CONCLUSION

Cooperation between members of an organization can be seen as involving routine transfers or exchanges of various kinds of resources. Structural analysis of cooperation and management of various types of social resources enhances understanding of effective participation in collective action by highlighting the relationship between choices of important sources of resources in a specific type of organization. This approach helps identify generic social mechanisms that can be seen as constituting a form of corporate social capital (Leenders & Gabbay 1999). In the case examined here, the mechanism consists of encouraging then taming unbounded status auctions among peers. Using a network study of a corporate law firm, we were able to reconstitute these structures in a specific work environment, one characterized by multifunctional and sometimes multidisciplinary task forces in which "status competition" is a particularly strong motivation driving participation. Specific statistical tools, p^* models, were used to analyze the interplay between the three social resources shaping cooperation among these professionals, and then to identify the functional role of this interplay in a mechanism dealing with this problem of status competition. These models revealed insights about the intersection of networks (a key feature of this governance mechanism) at the substructural level that would not have been apparent with less sophisticated data analysis methods. The importance of configurations reflecting the presence of this social mechanism flesh out the form of collective social capital identified here.

In conclusion, this approach to social capital points out the importance of considering organizations as sets of generic social mechanisms (Hedstrom & Swedberg 1998) attached to governance problems. These social mechanisms are exemplified by this exchange system, and contribute to corporate social capital by helping to provide structural solutions to collective-action problems. Given that analyses were applied to a single case study, we are in no position to generalize to other organizations based on the findings reported. It remains to be seen whether this pattern has relevance for other types of collegial organizations or knowledge-intensive firms, such as professional business partnerships in medicine, engineering, accounting, scientific or R&D laboratories, and universities; in such orga-

nizations, the production process is difficult to routinize and professional expertise and advice cannot easily be standardized; as a result, "internal" transaction costs for the firm as a whole can be assumed to be a large part of the total costs of collective action. One might therefore expect to find a need to combine systematically several kinds of resources in order to make collective action possible. Thus, beyond our general statement regarding the connection between specific mechanisms as forms of social capital and members' participation in collective action or cooperation, more work needs to be done to extend such an approach to other types of mechanisms and organizations.

This conception of social capital is consistent with a general sociological tradition that focuses on social mechanisms supporting and enhancing economic performance, beginning with Durkheim (1893) and now strongly established (Burt 1992; Macaulay 1963; Bourdieu 1980; Coleman 1990; see Flap, Bulder, & Völker 1998, and Gabbay 1997 for a review). Here, maximizing performance not only means improving technology, product and organizational innovation, managerial coordination, or financial management. It also means maintaining the specific local constellations of relationships that are the basis of social mechanisms and that help organizations solve problems of coordination.

APPENDIX A: SOCIOMETRIC NAME GENERATORS USED TO ELICIT CO-WORKERS, ADVICE, AND ROLE-DISTANCE TIES

Here is the list of all the members of your firm.

Strong co-workers network: Because most firms like yours are also organized very informally, it is difficult to get a clear idea of how the members really work together. Think back over the past year, consider all the lawyers in your firm. Would you go through this list and check the names of those with whom you have worked with. [By "worked with" I mean that you have spent some time together on at least one case, that you have been assigned to the same case, that they read or used your work product or that you have read or used their work product; this includes professional work done within the firm like bar association work, administration, etc.]

Basic advice network: Think back over the past year, consider all the lawyers in your firm. To whom did you go for basic professional advice? For instance, you want to make sure that you are handling a case right, making a proper decision, and you want to consult someone whose professional opinions are in general of great value to you. By advice I do not mean simply technical advice.

Friendship network: Would you go through this list, and check the names of those you socialize with outside work. You know their family,

they know yours, for instance. I do not mean all the people you are simply on a friendly level with, or people you happen to meet at firm functions.

NOTES

We would like to thank Ron Burt for useful suggestions.

1. This term refers to Merton's (1959) observation on status segregation as a mechanism for managing role strain.

2. Goffman thought that constructing role distance was an individual activity, often a product of one's sense of humor. We think that it is a more relational activity; one needs others to construct this distance.

3. Listen, for example, to Partner 18: "Our firm is almost exclusively a joint economic enterprise. If I were to pick up a paper tomorrow morning and learn that a lawyer was hit by a car, I would be concerned. If he is in my firm, I would be more concerned. But that marginal difference would not be that significant, unless I work with him, know his family and his children. There are lots of lawyers in the community that I care more about than for some of my partners. I see a partnership more like an economic unit. There is the economic sense of mutual obligation, of enhanced goodwill and cooperation. We help each other with work. I expect more goodwill from a partner than from a stranger, but that's all. 'I'll be glad to do that.' But my whole life does not revolve around my partners. When people are too close, it creates problems too. And it is not necessary for partnerships to survive. There is a leap of faith that's required that a partner would not seek a circumstance that is harmful to me. That may be naive. Our compensation system is a guarantee for that leap of faith. A change in that would undermine the sense of security that I feel with my partners."

4. This comes across in Partner 13's following observation: "When the firm was small, among other things all partners had a good idea of what other partners were doing. There was a much greater level of social integration, I think, firm-wide, and a tendency to look much more inwardly toward the firm as sort of almost a family away from a family. In our instance, probably thirty years ago the partners in the firm tended to represent the most central social circle for themselves. When the firm gets to be this size there is still a tendency to look inwardly toward the firm but it's obviously no longer a closely knit family because there are lots of partners that you won't see for weeks at a time. And so there tends to be if anything a tendency for partners to start to look outward from the firm as opposed to inward to the firm. The closeness tends to be reduced. Now what you have are people whose predominant social circles may include other lawyers within the firm, but probably include many more people outside the firm. That's a healthy development, not an unhealthy development."

5. Overall densities for co-work, advice, and role-distance (or friendship) networks are respectively 0.22, 0.17, and 0.11.

6. In the case of a multirelational Markov assumption, the model for the network is expressed in relation to substructures of a multivariate triad, or of a multivariate star of order $n - 1$ (for a network of n nodes; see Pattison &

Wasserman, in press). We have not reported analyses of the role of higher-order stars of order three or more (that is, of substructures comprising three or more ties directed to or from a member of the firm), since preliminary investigations suggested that higher-order stars play a much less substantial role than the multivariate triadic configurations on which we focus here.

7. A hierarchical model elimination procedure was used: at any step, only those parameters corresponding to higher-order substructures were considered for elimination (i.e., setting to zero). Thus, if one substructure was a subset of another substructure in the model at any step, only the second was considered for elimination at that step.

8. Bivariate analyses confirmed that no additional level 4 triadic structures involving two relations made substantial contributions to model fit.

9. In Table 1, negative parameters for each type of tie signify that a tie between two actors is less likely than no tie (and the relative magnitudes of the parameters confirm, for example, that work ties are the most frequent and friendship ties are the least frequent).

10. For step 1 configurations (with a reciprocated work tie between i and j and an advice tie from i to k) and step 2 configurations (with an advice tie from i to j and from i to k, and a friendship tie from j to k):

Status of			Number of step 1 configurations	Number of step 2 configurations
i	j	k		
A	A	A	508	503
A	A	P	1179	209
A	P	A	646	251
A	P	P	1470	693
P	A	A	456	57
P	A	P	535	105
P	P	A	2852	122
P	P	P	2921	1415

A: Associates; P: Partner

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9

Social Networks and Social Capital in Extreme Environments

Jeanne S. Hurlbert, John J. Beggs, and Valerie A. Haines

Social capital has become a key concept in modern sociology. Despite that fact, its meaning remains the subject of an ongoing debate in both theoretical discussions and empirical applications. In this chapter, we draw on Bourdieu (1986:248) to define social capital as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition." As Portes (1998:1) points out, this definition "makes clear that social capital is decomposable into two elements: first, the social relationship itself that allows individuals to claim access to resources possessed by their associates [social networks and their constituent ties] and second, the amount and quality of those resources [social resources]." We use that definition to link our research on social networks and social resources in two extreme environments: Hurricane Andrew and the underclass.

Studies of the ways in which social networks and their constituent ties provide social capital have generally neglected an important context, extreme environments. Network studies of social support have focused on the association between the structure of routine interpersonal environments, or core networks, and the receipt of informal support, neglecting to ask how these environments allocate resources in nonroutine situations (but see Hurlbert, Haines, & Beggs 2000). Social-resources researchers have asked how ties drawn from social networks provide social capital (e.g., information and influence) in a nonroutine situation, job finding, but they

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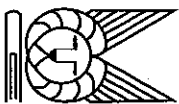*Michael R. Smith*

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