

Informal Networks, Social Control, and Third-Party Cooperation*

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Network models of social control suggest that informal ties between managers can have an important role in helping these managers to catalyze cooperation in their task environment. By enhancing the managers' ability to coordinate their behavior towards third parties, networks can help them pose concerted demands on such parties, increasing the social pressure to cooperate for reluctant players and reducing behavioral uncertainty for cooperative ones. An analysis of project teams within the Italian subsidiary of a multinational high-technology firm shows that the intensity of communication among the managers coordinating a team increased the probability and the level of cooperation between managers and other team members, as well as between those team members.

This paper examines the effect of informal communication between managers on their ability to elicit cooperation from people in their immediate task environment. While informal ties between interdependent actors have been often associated with their propensity to cooperate with one another (Granovetter 1985; McAllister 1995; Uzzi 1996), less attention has been paid to the effects of such informal ties on those actors' ability to elicit cooperation from third parties in their task environment. The topic is particularly relevant for managers, since securing cooperative behavior from other people is a crucial part of their role (Barnard 1938; March and Simon 1958; Mintzberg 1973). In this paper, I argue that, by enabling managers to take concerted actions towards third parties, informal ties between those managers enhance their ability to elicit cooperative behavior from those parties. Drawing on network theories of social control and influence (Burt 1992; Gargiulo 1993; Lazega and Lebeaux 1995), I identify social mechanisms behind the effects of informal ties between managers on their ability to promote third-party cooperation and formulate hypotheses that specify observable outcomes of these effects. I test these hypotheses using data from project teams within the Italian subsidiary of a multinational high-technology firm.

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Networks and Cooperation in Organizations

More than sixty years ago, Chester Barnard (1938:75) defined formal organization as “a *system of cooperative activities* of two or more persons” (emphasis in original). Yet, he also recognized that successful cooperation in formal organizations “is the abnormal, not the normal, condition” (Barnard 1938:5). While interdependence between organizational members should be sufficient to trigger cooperation towards common goals, a variety of individual and systemic factors create differences in the interests and perceptions of organizational members, hindering their ability and willingness to cooperate (March and Simon 1958). Indeed, some scholars have pointed at the existence of an “inherent conflict” between the demands placed by the organization on its members and the desires and needs of those members (Kunda, 1992:11). Organizations, therefore, cannot simply rely on voluntary cooperation from their members: they have to secure it.

Organization theory has attacked the problem of cooperation from the standpoint of the diverse control mechanisms through which management tries to secure the behaviors expected from their members (see Pfeffer, 1997:100ss. for review). Traditionally, those mechanisms have relied on “inducements” that seek to align the interests of the participants with those of management (Barnard 1938; March and Simon 1958) and on surveillance by a hierarchical authority that enforces compliance using organizational rules and procedures (Weber 1978,I:48; Blau 1955). More recently, scholars have emphasized mechanisms that operate behind the formal structure of hierarchical surveillance and incentives. Typically, those mechanisms are associated with the internalization of values and norms of cooperation of a strong corporate culture (Kunda 1992; O’Reilly and Chatman, 1996).

Regardless of the means utilized, management is expected to play a crucial role in securing the cooperation of organizational members (Barnard 1938; March and Simon 1958; Dalton 1959; Mintzberg 1973). This traditional aspect of the managerial role has taken a new dimension in the so-called “post-bureaucratic” or “network” organization (Nohria and Eccles 1992). These organizational blueprints, heralded by management gurus such as Tom Peters (1988) as the key to success in the post-industrial economy, penetrate an increasing number of firms.¹ The new organizational structures are characterized by the attenuation of bureaucratic control, flatter structures, and teamwork, which have a substantial impact on the ways in which managers have to perform their roles (Kanter 1989). The horizontal cooperation that increasingly permeates contemporary organizational environments cannot be easily attained through the formal coordination mechanisms of the traditional command-and-control organization. Moreover, the complex nature of the tasks at hand reduces the effectiveness of incentive systems, which soon become too complex to devise and to

¹ For example, a survey of 43 *Fortune 500* companies in the early nineties showed that 86% of the respondents were working with cross-functional teams (Filipczak, Bob Gordon, Hequet, and Picard 1994). Similar trends can be observed in European firms.

administer. Horizontal cooperation ultimately requires a climate of trust and effective communication across the old organizational boundaries (Baker 1992; Henke et al. 1993; Hauptman and Hirji, 1996; Sheppard and Tuchinsky 1996). Informal ties and group norms, once viewed as obstacles to attain management goals (Perrow 1986:81), are increasingly considered valuable tools to help organizations to enhance cooperation among its members and to boost performance (Barker 1993). Yet, the functional silos that for years reigned in traditional organizational structures are often effective barriers to horizontal cooperation.

In this new organizational context, the effectiveness of managers as catalysts of cooperation is based less on authority and material incentives and more on subtle mechanisms of social control. The analysis of social control in organizations has typically emphasized the role of norms and shared values of the corporate and group culture (Kunda, 1992; O'Reilly and Chatman, 1996). Yet, the emergence and the reproduction of those norms typically requires a "core" of organizational players fully identified with those values and in the position to socialize third parties into those norms (Barker 1993:426). As the pioneering work of Festinger (1950) demonstrated, social control is ultimately created and reproduced through cohesive ties among those who seek to impose control. Social theory also suggests that the existence of a cohesive social relationship among members of the "core" is essential to their capacity to effectively impose norms of cooperation to third parties (Coleman 1990:269). The importance of a cohesive "core" in eliciting cooperative behavior is illustrated in Milgram's (1974) famous experiments on obedience to authority. In these experiments, the biggest drop in subjects' cooperation with the experimenter occurred when the experimenter was openly challenged by peers in front of the subject. The "open conflict" between the experimenter and his peers created opportunities for non-compliance that subjects could use to cease their cooperation with the experimenter.

The prior discussion suggests that managers linked by cohesive ties should be more likely to elicit cooperation from interdependent third parties—that is, from parties whose collaboration is necessary to attain a given goal. This prediction is consistent with theories of social control in networks. Analyzing ties among interdependent managers, Gargiulo (1993) showed how managers build strong ties with another manager who can influence a non-cooperative third party in order to secure cooperation from this party. This "two-step" leverage strategy is akin to the notion of "network closure" proposed by Coleman (1990). The tie between the two managers enables them to take concerted action towards the non-cooperative third party, which effectively curtails this party's structural autonomy and enhances the likelihood of his complying with the managers' demands. The underlying structural mechanism is the mirror image of Simmel's (1950) discussion of the *tertius gaudens*, in which he analyzes the benefits accruing to a third party that faces two disconnected players. More recently, Burt (1992) has elaborated on this insight in his theory of "structural holes." According to structural hole theory, the more an actor depends on coordinated parties, the higher the pressure to conform to the expectations of the

coordinated actors. Thus, a tie between two managers that seek cooperation from a third party effectively closes a “structural hole” around this third party, which reduces his autonomy vis-à-vis the coordinated managers and may force the cooperation of that third party (Gargiulo and Benassi 1998).

So far, the discussion has implicitly assumed a third party that is somewhat reluctant to cooperate. However, the model proposed here does not require such an assumption. Lack of communication between managers seeking to elicit cooperation from a third party may limit their ability to do so even if the third party is eager to cooperate with those managers. The situation is well known to managers working in “matrix” structures (Davis and Lawrence 1977; Ford and Randolph 1992), where they have to report to two different bosses—typically, a “functional” or “regional” boss on one dimension, and a “product” or “business” boss on the other. People working in these type of structures often experience considerable amounts of strain and frustration when their two bosses fail to coordinate their demands, hence rendering the subordinate unable to take action. Podolny and Baron (1997) recently advanced a similar argument. Analyzing egocentric networks of middle managers in a high-technology firm, they found that managers accountable to unconnected individuals were less likely to advance in the organization and reported lower job satisfaction.

The effects of ties between managers on their ability to elicit third party cooperation may affect both the probability and the level of that cooperation. This distinction is particularly relevant in organizational contexts. While poor levels of cooperation between interdependent individuals can have detrimental effects on the organization’s performance, greater harm can be caused by the complete failure to cooperate. The distinction is also relevant from the perspective of the argument advanced in this paper. While ties between managers may help them create a climate that enhances the cooperative behavior of well-disposed team members, they may fail to elicit cooperation from recalcitrant parties. Since higher *level* of cooperation may occur without increasing the *probability* of cooperation—defined as the probability that two people would display some minimal level of cooperation with one another—the distinction is important to adequately assess the effects of social ties between managers on third party cooperation. The logic of my argument suggests that such ties should make it more difficult for reluctant players to totally withdraw from cooperation, hence increasing the probability of cooperation in the task environment. At the same time, cohesive ties between the managers should help them enhance the cooperative behavior of well-disposed people. Thus,

HYPOTHESIS 1a. Under conditions of interdependence, informal communication between managers increases the probability of cooperation between these managers and third parties in the managers’ task environment.

HYPOTHESIS 1b. Under conditions of interdependence, informal communication between managers increases the level of cooperation between these managers and third parties in the managers' task environment.

The same mechanism of social control that allows coordinated managers to obtain cooperation from third parties can enhance their ability to promote cooperation *between* those parties whenever there is need for such cooperation. Managers who can coordinate their actions through informal communication ties are better positioned to enforce cooperative behavior between reluctant third parties and to reduce the uncertainty faced by well-disposed ones. Thus,

HYPOTHESIS 2a. Under conditions of interdependence, informal communication between managers increases the probability of cooperation between third parties in the managers' task environment.

HYPOTHESIS 2b. Under conditions of interdependence, informal communication between managers increases the level of cooperation between third parties in the managers' task environment.

I test these hypotheses with data on managers operating in a special unit of a European subsidiary of a high-technology firm. The managers' main predicament was to catalyze cooperation in cross-functional project teams to provide specific solutions to both internal and external customers. The highly complex technological and organizational nature of the projects created reciprocal task interdependencies among all team members, making intense cooperation a prerequisite of success.

Data

The data analyzed in this paper comes from a self-administered questionnaire completed by all the 19 managers working in a newly created special unit in charge of coordinating cross-functional project teams in the Italian subsidiary of a leading multinational American computer firm. At the time of the survey, the subsidiary employed about 14,000 people, out of whom 3,000 worked in two manufacturing plants producing for Italy and for the rest of the world. The questionnaire covered information on the respondent's involvement in project teams, as well as on his or her informal communication with the colleagues within the unit. Managers who were in charge of following up the progress of a given project team were also asked to fill out a booklet with information on the project and the participants, including an evaluation of the level of cooperation between all pairs of team members. The questionnaire was tailored using field information gathered from June 1991 to December 1991.

At the time of the research, the Italian subsidiary was undergoing important organizational changes that reflected in part the worldwide reorganization of its parent firm. Like most firms in the industry, the company was dealing with difficult market conditions. Impressive price-cutting and growing competition were eroding profit margins, forcing firms to reshape their activities. In this context, the search for more effective organizational configurations was a major endeavor for computer manufacturers (The Economist 1993). This firm was not an exception. At the time of

the study, several initiatives of organizational change were under way. Headquarters explicitly launched some of these initiatives, while others were emerging out of the everyday practice of organizational transformation. Among these emergent strategies, a small unit operating in one of the Italian plants, the *Direzione di Processi Industriali* (Direction of Industrial Processes, or DPI) was created in January 1991 to promote alternative forms of horizontal cooperation in the subsidiary. This cooperation was crucial to materialize the newly created business unit organization and to effectively bring down the rigid barriers of the prior functional structure, which top management saw as a major obstacle to improve efficiency. In this sense, the unit can be adequately characterized as a “catalyst” of change, an image that the DPI leadership perceived as an accurate description of their role within the firm.

Conceived as a support unit, DPI had a broad scope of activities. The unit operated both inside and outside the company, providing solutions to internal business units, top management, and functional managers, as well as facilitating the link between external clients and internal units. Its competencies included helping to devise manufacturing strategies for the two Italian plants, to develop a market-driven quality approach, to promote cooperation across business units, and to create tools and methods to implement these different initiatives. It also coordinated activities of the people in charge of setting long-term strategies and represented the Italian plant in international company hearings. Most of these multiple activities were implemented through project teams that brought together people from within and outside the firm.

The high technical and organizational complexity of the projects created strong reciprocal interdependencies among all team members, requiring their active cooperation to design compatible solutions. Yet, the hierarchical culture of the old functional “silos” was ill adapted to this form of work. As one non-DPI senior manager put it after a training session, they were aware that they need to work differently, but they did not know how to operate in the new environment. Each project team had one or more DPI managers, who were assigned taken into consideration the specific skill and coordination needs of the project. In addition to contributing their technical skills, the DPI managers played a crucial role facilitating cooperation in the project teams.

Between January and October 1991, DPI was directly involved in 73 of such projects. At the time of the survey, 70 percent of the projects were still under way, 20 percent were recently completed, and 10 percent abandoned. One third of these projects was a continuation of those carried out by previous units. The remaining ones were either a direct initiative of DPI (43 percent) or were launched upon internal or external customers’ demands (57 percent). DPI formally led 63 percent of the projects, but its managers had a crucial role as catalysts of cooperation in all the teams they participated, even when the unit had not taken formal leadership. Sixty-seven percent of the teams had more than one DPI member. Because of the relative lack of organizational experience with cross-functional teamwork, the other team members typically looked at DPI for guidance on how to handle group processes and to coordinate the work. To adequately perform their dual task, DPI managers had to

coordinate their own interventions in ways that did not interfere with the functioning of the teams.

The average DPI manager was responsible for 3.84 out of the 73 projects, ranging from 1 to 7. Since I am interested in how poor informal communication between DPI managers affected their ability to elicit cooperation from and to promote cooperation between other team members, I have restricted the analysis to projects in which there were at least two DPI and two non-DPI participants. There were 39 such projects, out of which 25 were still ongoing at the time of the survey. To eliminate possible concerns about the non-simultaneity of the network data and the cooperation data, the results presented in this paper are based on the reduced set of 25 ongoing projects. An analysis of all 39 projects, however, yielded results that are essentially identical to the ones reported here. The mean number of participants in the 25 ongoing projects was 9.36 people, representing 5.04 different organizational units, including DPI. On average, DPI contributed 3.52 people to these projects, one of whom was formally responsible for the follow-up of the project before the head of DPI. All but 6 DPI managers were responsible for at least one of those 25 projects, ranging from 1 to 5.

The 25 ongoing project teams comprised 234 different people—among which 19 were from DPI. While people may have had some initiative in choosing to participate in a given team, participation largely resulted from assignments by their superiors. The most important reason for assigning people to teams was their affiliation with a given unit whose participation was required due to the nature of the project (44.9 percent of the people). The second most important reason was the technical expertise of the participant (37.6 percent). Through their joint involvement in projects, these people generated 514 dyads formed by one DPI manager and a third party—that is, a person from a unit other than DPI—and 487 dyads formed by two third parties. Since the outcome variable (cooperation) is symmetric, reverse-order dyads within a project team were eliminated to avoid double counting, but the same dyad may appear in different projects.

Variables

I model the probability and the level of cooperation in dyads of people jointly participating in a project team as a function of the communication between the DPI managers within that team, controlling for project and unobserved dyad-specific characteristics that may have an impact on dyadic cooperation. The following is a description of the variables in the analysis. Table 1 presents descriptive statistics and the correlation matrix for these variables for the two types of dyads in the analysis—those composed by a DPI manager and a third party, and those formed by two third parties.

INSERT TABLE 1 ABOUT HERE

Cooperation. This is the dependent variable in the analysis. For each project under his supervision, the DPI manager formally responsible for the follow-up of the project reported dyadic ratings of the cooperation between all team members, on a zero (no cooperation) to three (strong cooperation) scale. I use these ratings to construct two variables that capture the level and the probability of cooperation for each dyad within a project team. The *probability* of cooperation is modeled on a dichotomous variable set to one if the reported cooperation for the dyad was higher than zero. The *level* of cooperation is the reported cooperation score for the dyad. Following the distinction made in the hypotheses, I distinguish between (i) cooperation between DPI managers and third parties in the team and (ii) cooperation between third parties. To control for possible rater bias, I also estimated models using standardized cooperation scores.

Communication is the average self-reported communication between DPI managers jointly participating in the project teams. Each DPI manager was presented with a complete list of his or her 18 colleagues within the unit and asked for the extent to which he or she routinely consulted with each colleague regarding matters that concerned their work in the unit. Managers could rate their answers from 0 (no consultation) to 3 (strong consultation).² I have retained the asymmetries in consultation that might have existed in the self-reported data, making the measure sensitive to non-reciprocated ties. To check the robustness of the results, I also estimated models using a proportional measure of communication, which removes potential distortions introduced by managers who might have a tendency to over-report their consultation with other colleagues.³

I have introduced a number of control variables that could affect dyadic cooperation within project teams. Some of these controls capture particular conditions of the project in which the dyad had to cooperate, whereas others refer to characteristics of the dyad members that might affect their ability and willingness to cooperate.

Project duration is the number of months since the start of the project. The duration of the project could have affected cooperation in two opposite ways. On the one hand, longer projects should give participants a better chance to develop the mutual trust and understanding than foster cooperation, which would lead to a positive association between project duration and cooperation. On the other hand, relational problems

² Congruent with the blueprint of DPI, the internal communication network reveals a flat, dense informal structure. The average strength of communication ties was 1.326 (on a 0-3 scale). Out of the 342 possible consultation ties, 62.6 percent were present. Any member of the unit could reach any other member in a maximum of three steps.

³ Specifically, the proportional measure of manager *i*'s communication with manager *j*, S_{ij} , is the proportion of attention manager *i* had to allocate to manager *j*, both as a result of his seeking out *j* and of being sought out by *j* (being s_{ij} the self-reported raw measure and $0 \leq s_{ij} \leq 3$):

$$S_{ij} = (s_{ij} + s_{ji}) / \sum_q (s_{iq} + s_{qi}); \quad i \neq j, q \quad \text{and} \quad \sum_i S_{ij} = 1 \text{ for all managers.}$$

within the team may be more likely to arise in long, complex projects, having a negative impact on cooperation.

Project size. The number of participants in a project can also have opposite effects on cooperation. On the one hand, larger project teams might have suffered from the problems of free riding and “social loafing” (Latané, Williams, and Harkim, 1979) that are common in such groups, as well as from standard coordination problems (Steiner 1972). If such problems existed, the number of participants should have had a negative impact on cooperation. On the other hand, the climate in a small team may be more severely affected by setbacks or personal animosities that either pre-existed or developed during the project, which might result in weaker cooperation.

DPI leadership is a dummy variable set to one if DPI was the leading organizational unit for a project. Although DPI managers were always expected to facilitate cooperation in the project teams, the unit assumed an official leading role only in 16 of the 25 projects examined here. While DPI managers might have exhibited higher levels of commitment in projects led by their own unit, DPI leadership could have induced also lower levels of commitment from the third parties, affecting their willingness to cooperate.

Same organizational unit is a dummy variable set to one if the two members of a dyad work in the same organizational unit. Given the difficulties associated with cooperating across organizational boundaries, one can expect the level and the probability of cooperation to be higher between people coming from the same organizational unit. This variable only applies to the analysis of cooperation between third parties, since cooperation between DPI managers and third parties is always cross-unit.

Cooperativeness. Finally, I have also controlled for unobserved factors that may have affected cooperation in the dyads. These factors have both substantive and methodological implications. Dyadic cooperation might have been affected by individual-specific characteristics. Simply stated, unobserved factors may make some people better than others at cooperating, independently of the context in which this cooperation takes place. A similar reasoning applies to dyads. Unobserved factors—such as informal ties that may exist or arise between people—may make some dyads more prone to cooperate than others. While individual and dyadic unobserved heterogeneity could be assumed random in a sample of independent observations, this is not the case with the data analyzed in this paper. Because multiple dyads involve the same actor, and because the same dyad may appear in various projects, common actor effects may appear, creating a statistical problem known as “network autocorrelation”. I have addressed this problem by including an autorregression variable suggested by Lincoln (1984).⁴ This independent variable is the mean of the dependent variable

⁴ While several approaches have been designed to control for this problem, not all of them are applicable to my data. Indeed, both quadratic assignment procedure (Krackhardt 1988) and the more recent p^* models (Wasserman and Pattison 1996) assume the existence of a full network, which is not the case for the data in my sample. Constructing a full network among all people in the project teams would amount to an artificial inflation of the risk set to include dyads of people who never had a chance

across all dyads that include either firm i or j , excluding the realization of the variable in the ij^{th} dyad. This variable captures both unobserved nodal effects (the individual's propensity to cooperate) and dyad specific effects that are otherwise excluded from the model.

Results

Table 2 presents estimators of the impact of the mean level of communication ties between DPI managers in a project team on third party cooperation within that team. Models 1 and 3 present Logit estimators of the effects of the independent variables on the probability of cooperation in the dyads, whereas Models 2 and 4 report OLS estimators of the variables' effects on the level of cooperation in the same dyads.

INSERT TABLE 2 ABOUT HERE

The mean level of communication between DPI managers in a team had a strong, statistically significant effect on both the probability (Model 1) and the level (Model 2) of cooperation between DPI managers and third parties in that team, thus furnishing support for Hypotheses 1 and 2. Communication between DPI managers in a team also had a significant effect on both the probability and the level of cooperation between third parties in that team (Model 3 and Model 4), providing support for Hypotheses 3 and 4 respectively. I checked the robustness of these results using a proportional measure of the strength of communication between DPI managers (see footnote 3), which yield similar effects. These effects are independent of unobserved factors that affected the propensity to cooperate in the dyads, which were accounted for by the significant impact of “cooperativeness”, the autorregression variable included in the model, as well as from project-specific factors (duration, size, and the leading role of DPI).

The effects of the control variables merit some additional comments. “Project duration” had a significant effect on the probability of cooperation between third parties in a team, as well as a weak influence on the level of such cooperation. This result is compatible with the idea that cooperation between third parties benefited from the time during which those parties had to work together in the team. The effects were in the same direction for the cooperation between third parties and DPI managers, but they were weaker and not statistically significant at the .10 level. “Project size”—the number of people in the team—only had a small positive effect on the level of cooperation between third parties, suggesting that, other things being equal, people

to cooperate, since they were never part of the same project team. Moreover, since some dyads participated in more than one project team, I would have been forced to create a summary measure to capture their cooperation across all those projects. Yet, my hypotheses are particularly concerned with the variance in cooperation across projects, which I relate to the social conditions of those projects. Constructing summary measures of cooperation and local conditions would erase much of the variance necessary to test these hypotheses. For these reasons, I opted for a solution that preserves the dyadic nature of the data.

from units other than DPI were less likely to cooperate with one another in small teams. It is worth mentioning that, because the minimal number of DPI managers in the selected projects was two, small project teams were de facto “dominated” by DPI people, which might have resulted in lesser involvement of the third parties.

The effects of the leading role of DPI were more interesting from a substantive viewpoint. Although DPI managers attained higher levels of cooperation with third parties in project teams led by DPI, they were less likely to elicit cooperation from reluctant players in those teams. Model 1 shows that the probability of cooperation between third parties and DPI managers was substantially lower in DPI-led project teams. DPI leadership, however, did not have an effect on the cooperation between the third parties. The pattern of cooperation in the projects led by DPI apparently corresponded to a “hub-and-spokes” structure. The hub was occupied by a group of DPI managers who were able to obtain high cooperation from well-disposed third parties in the team, but failed to engage the more reluctant players. The reluctant third parties seem to have perceived these projects as DPI’s show, not theirs.

A similar pattern can be observed for the effects of “similar organizational unit” on the cooperation between third parties in a team. While team members from similar organizational units displayed higher levels of cooperation with one another than members from different units (1.398 vs. .881), the difference was much smaller for the probability of cooperation (.610 for same-unit team members; .580 for different unit ones). Thus, when the conditions of the project and the unobserved dyadic propensity to cooperate is controlled for, people from the same organizational unit were less, not more, likely to cooperate than people from different units. Those who did cooperate, however, did it in an unexpectedly intense way. One possible explanation for this pattern is that people from the same organizational unit were more likely to know each other and to have had a chance to work together in the past, which would naturally evolve in some mutual expectations about joint work. Good prior working relations resulted in high levels of cooperation within the new project teams. However, people from the same unit who came to the teams with negative experiences from their prior work in the unit would be less willing (or able) to cooperate within those teams.

Discussion

This study builds on theories of autonomy and control in social networks to assess the effects of social ties between managers on their ability to catalyze cooperation with and among interdependent third parties. It shows that informal communication ties between managers create structural conditions that enhance the cooperative behavior of third parties working in the immediate task environment of those managers. Informal communication between managers allows them to enforce cooperation on reluctant third parties and to present coherent demands that facilitate cooperation for well-disposed players. As such, the study shed light on how social ties can help managers in a crucial aspect of their role, namely, securing cooperation from people in their task environment. While effective horizontal cooperation may

ultimately require willful, trusting actors, the results reported in this paper show that both the probability and the level of horizontal cooperation can be catalyzed by managers' concerted social control on players that might be otherwise reluctant or unable to initiate fruitful cooperative exchanges. Cohesive networks among those managers allow them to exert such social control.

The research reported in this paper is grounded in existing network theories of control and contributes to those theories by illuminating the impact of social ties on third party cooperation. The network data was obtained during an exhaustive field study of interdependence, network, and personal attributes across all projects facilitated by a single organizational unit, which attenuate the boundary specification problems that often affect network studies. Despite these positive aspects, this study has limitations that call for caution in exploring its implications. These limitations largely stem from the nature of the data. While I had a good indicator of informal ties among the managers working for DPI, the unit in charge of coordinating the project teams, I did not have similar information on informal ties involving the third parties in the project teams. To circumvent this problem, I have introduced an autorregression variable (cooperativeness) that accounts for unobserved factors that might have affected the propensity to cooperate between specific team members, such as informal ties that either pre-existed or emerged as a by-product of prior successful cooperation.⁵

Another limitation that may raise doubts about the findings reported here stems from the measure of cooperation used in the study. This measure is based on the assessment of cooperative behavior between pairs of team member by the DPI manager in charge of following up the work of the team. While this person allegedly was in the best position to make such an assessment, difference in ratings may reflect the "rating style" of the DPI manager in charge of following up the project rather than true variation in the levels of cooperation attained in these projects. To assess this possibility, I ran the cooperation level models using cooperation scores standardized by rater. It is worth mentioning, however, that the use of standardized scores assumes that raters faced an homogeneous set of projects from the standpoint of cooperation and that observed differences in mean ratings and variance were due to their rating style rather than to the objective conditions of the projects. Fieldwork information on a selected number of projects suggests that such an assumption is not warranted—at least, it is less warranted than assuming "unbiased" raters—since there were true differences in the levels of cooperation attained in the teams. Despite the likely distortion introduced by the assumption behind the standardized scores, the results were still consistent with the ones obtained with the raw measure of cooperation. The average communication between the DPI managers in a team had a statistically

⁵ An analysis at the dyad level reveals that cooperation in third party dyads increased with the number of times the members of the dyad faced each other in project teams. However, the size of the effect suggests that the impact of repeated encounters on cooperation was marginal ($r = .119, p < .01$). The effect is also weak for dyads between a DPI manager and a third party ($r = .150; p < .01$).

significant effect on the standardized cooperation scores between third parties in that team ($b = .206$; $p < .01$). Although the effect for the standardized cooperation between DPI managers and third parties was not significant at the .10 level ($b = .101$; $p = .257$), it was in the direction predicted by Hypothesis 2. While rater bias cannot be completely ruled out, these results suggest that it did not play a major role in the effects reported in this paper.

Another possible bias could have occurred if the rater assessing the level of cooperation between team members had a tendency to give higher ratings to the people he was tied to. Having only partial information on informal ties, I cannot perform a thorough check on this possible favoritism, but I still can examine the ratings giving to their DPI peers in the team (not considered in my analysis), for whom information on informal ties is available. Indeed, raters did give on average stronger marks for cooperation to DPI peers strongly tied to them, which would suggest that raters might have done the same when evaluating their own cooperation with third parties. Yet, higher ratings for cooperation with team members informally tied to the rater are not necessarily a bias; rather, they may well correspond to true superior cooperation with those parties. Indeed, research on cooperation in dyads *predicts* that cooperation should be higher between people sharing a strong informal tie (McAllister 1995; Uzzi 1996). Hence, the higher scores for dyads between the rater and team members strongly tied to that rater would simply conform to a well-established research finding. Second, the results show that strong ties among DPI managers have an impact on both the cooperation between these managers and third parties *and* on the cooperation between those third parties. Since a good number of the ties between the DPI managers and third parties involved the rater, the biased-rater interpretation could rule out the first effect as spurious. It is unclear, however, how a bias in favor of the rater's strong-tie peers would account for the higher cooperation between third parties observed in teams with strong communication among the DPI managers. Given the strength of this last effect, it is unlikely that the results reported in this paper can be explained away as an artifact of rater bias.

The research reported in this paper contributes to the development of a network theory of cooperation in organizations by focusing on the control properties of such networks and their impact on cooperative behavior. Understanding the effects of networks on managerial effectiveness has become increasingly important in the dynamic environments of post-bureaucratic organizations (Burt 1997; Podolny and Baron 1997). Existing research has stressed the importance of trust and effective communication to attain cooperation between interdependent actors that may not be bound by a direct authority relation. This research has largely focus on networks as conduits of information and facilitators of communication between interdependent organizational members. In these studies, social ties are viewed as channels through which each player learns about the competencies and the reliability of the other, hence facilitating both the initiation and the consummation of cooperative exchanges (Granovetter 1985; Yamagishi and Cook 1993). While some recent studies have started

to explore the effects of common third parties on promoting trust and cooperation between actors, the main focus is still on networks as facilitators of trust, rather than as vehicles for social control (Burt and Knez 1995; Gulati 1995). Actors brought into a relationship of interdependence and tied to a common third party can use this party as a source of information about each other, which—in case of favorable inputs—can ease the initiation of the exchange. While a control argument based on a concern for reputation before common third parties is often introduced (Raub and Weessie 1990; Burt and Knez 1995), the emphasis is still on networks as conduits of information.

While this focus on networks as conduits of information is crucial to understand cooperation in non-hierarchical settings, networks are more than channels linking social actors: they are also structures of control (Coleman 1990; White 1991). Organizations, too, are as much about control as they are about sharing information. As Karl Marx pointed out a century and a half ago, the social production of economic life brings people into relations of interdependence that are largely independent of their will. This is particularly true of organizations, where people often become dependent on *particular* actors who have exclusive control specific resources (Pfeffer 1981), as opposite to a *type* of actors, as it is the case in a competitive market arena. Aligning the interests of interdependent members to secure their cooperation has been a continuing preoccupation for organizations. The attenuation of traditional forms of organizational control—i.e., bureaucracy—leaves organizations increasingly reliant on the two remaining control mechanisms: incentives and normative control.

The literature on normative control has emphasized the role of a shared organizational culture and values as an efficient substitute for the fading bureaucratic control. In this case, cooperation is secured by what Barker (1993) has dubbed “concertive control,” which is made effective through strong peer pressures to comply with norms that emerged out of the group processes (see also Hackman and Walton 1986:186). Yet, the effective implantation of normative control relies on the existence of social control, which ultimately rests on the substratum provided by networks (White 1991).

The prior discussion suggests that understanding how actors can use those networks to attain control should be a central task of contemporary organization theory. Yet, network scholars have only begun to explore the dynamics of control in non-discretionary relations of interdependence with potentially non-cooperative players (e.g., Gargiulo 1993; Lazega and Lebeaux 1995). This paper contributes to that exploration by proposing one way in which networks can help managers to elicit cooperation from third parties in non-hierarchical settings. In doing so, it helps our understanding of the relationship between networks and cooperation from the viewpoint of the role those networks can play as mechanisms of social control.

While the control perspective presented in this paper complements the growing literature on the effects of networks as facilitators of trust and cooperation between interdependent organizational actors, it also suggests fruitful areas of research where both approaches can be combined. Indeed, while social ties facilitate cooperation, they

can be also a consequence of successful cooperation (Marwell and Schmidt 1975:139ss; Macy 1991). Arguably, informal communication ties not only helped DPI managers to promote successful horizontal cooperation between third parties, but also to catalyze the formation of networks that, acting as conduits of information and trust, could be the basis for future cooperative endeavors between those third parties. Cooperation in organizations does not—and cannot—solely depend on the initial will or perceived interests of the players: it can be catalyzed by effective mechanisms of social control that drive those players into initial exchanges and can create favorable conditions for subsequent ones.

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Table 1
Mean, Standard Deviation, and Correlations

1a. Cooperation between DPI managers and third parties (N = 514)

Variables ^a	Mean	Stdev	1	2	3	4	5	6	7	8
1.Level of cooperation DPI-third parties	1.175	1.034	—							
2.Probability of coop DPI-third party	.680	.470	.789	—						
3.Mean communication among DPI managers	1.420	.466	.150	.222	—					
4.Project duration	24.330	11.010	-.007	.017	-.245	—				
5.Team size (# of participants)	11.680	3.230	.032	.014	-.109	.062	—			
6.DPI is leading unit (1 = Yes) ^b	.710	.450	.228	.192	.035	.054	.388	—		
7.Similar organizational unit (1 = Yes)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	—	
8.Cooperativeness	1.370	.302	.310	.249	.134	-.027	.004	.108	n/a	—

^b Similar organizational unit is constant for dyads between DPI and third parties.

1b. Cooperation between third parties (N = 487)

Variables ^a	Mean	Stdev	1	2	3	4	5	6	7	8
1.Level of cooperation between third parties	.970	.971	—							
2.Probability of coop between third parties	.610	.490	.806	—						
3.Mean communication among DPI managers	1.520	.603	.153	.265	—					
4.Project duration	24.537	10.794	.089	.147	-.051	—				
5.Team size (# of participants)	12.620	2.700	-.048	-.033	-.021	.008	—			
6.DPI is leading unit (1 = Yes)	.770	.420	-.063	.028	-.005	-.085	.509	—		
7.Similar organizational unit (1 = Yes)	.170	.380	.200	.097	-.166	.029	-.213	-.194	—	
8.Cooperativeness	1.094	.417	.441	.383	.115	.018	-.288	-.119	.051	—

^a Variables 1 and 2 are dependent variables in both tables.

Table 2**Effects of Communication Ties between DPI Managers
on Third Party Cooperation in Project Teams**

(Logit /OLS estimators and standard errors)

	Model 1	Model 2	Model 3	Model 4
	Probability of cooperation with third parties (Logit)	Level of cooperation with third parties (OLS)	Probability of cooperation between third parties (Logit)	Level of cooperation between third parties (OLS)
Constant	-2.942*** (.875)	-.674** (.305)	-4.559*** (.918)	-1.418*** (.278)
Mean communication among DPI managers	1.259*** (.293)	.235** (.095)	1.163*** (.202)	.234*** (.064)
Project duration (months)	.018 (.010)	.002 (.683)	.032*** (.010)	.007* (.004)
Project size (participants)	-.033 (.037)	-.001 (.373)	.063 (.049)	.054** (.017)
DPI is leading unit	-.867*** (.246)	.479*** (.102)	-.314 (.324)	.078 (.106)
Similar organizational unit			-1.035*** (.311)	.579*** (.105)
Cooperativeness (control)	1.617*** (.354)	.938*** (.143)	2.510*** (.340)	1.047*** (.096)
R-square (adjusted)	.131 ^a	.139	.247 ^a	.258
<i>F</i>		17.535***		29.181***
Chi-Square	71.789***		138.098***	
Number of dyads	514	514	487	487

*** $p < .01$; ** $p < .05$; * $p < .10$ ^a Cox and Snell R-square