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RESOURCES AND RELATIONSHIPS: SOCIAL NETWORKS AND MOBILITY IN THE WORKPLACE*

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

Interest in understanding how careers unfold within organizations has recently increased. However, these efforts have focused almost exclusively on features of formal organizations that influence mobility, overlooking one of the most important organizational influences on careers and work satisfaction—informal networks in the workplace (Gartrell 1987; Simpson 1989; Baron and Pfeffer 1994). Even in the most bureaucratic settings, informal social relations provide an important source of task advice (Blau 1955; Dalton 1959; Kanter 1977), can affect the

content and quality of decision-making (Crozier 1964; Hickson et al. 1971), and often become valued personal relationships for many workers (Roethlisberger and Dickson 1946; Warner and Low 1947).

Researchers examining how networks shape mobility usually have focused on how social ties affect status or income attainment in the broad labor market (Lin, Ensel, and Vaughn 1981; Lin 1982; Campbell, Marsden, and Hurlbert 1986; Lin and Duman 1986; Boxman, De Graaf, and Flap 1991), entry into organizations (Granovetter 1974; Bridges and Villemez 1986; Montgomery 1992), or perceived potential for advancement (Ibarra 1995). Less attention has focused on how networks affect the outcomes of promotion contests within the firm. Perhaps the most systematic exploration of network effects on career advancement within the firm is Ronald Burt's analysis of intra-organizational mobility in his work *Structural Holes* (1992). Burt documents how the same configuration of network ties that creates opportunities for brokering and entrepreneurialism in relations among firms—a network full of structural holes (i.e., being connected to many actors who are themselves unconnected)—also enhances career opportunities for actors competing for promotions within an organization. While ad-

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miring Burt's work, we argue that his study ignores the interaction between network structure and content. Burt's structuralist conception—developed to understand exchange relations among firms and industries in a competitive market context—reflects a highly instrumental view of networks that is less appropriate for studying mobility within organizations.

Burt conceptualizes network ties in terms of information and resources that actors can access in competitive situations, including mobility contests. In a network containing many "structural holes," it is easier to assimilate diverse resources and information and to play people off against one another. We emphasize a different conception of social networks, drawing on Coleman's (1990) notion of "social capital" and the extensive literature on community ties (Wellman, Carrington, and Hall 1988; Wellman and Wortley 1990). Both literatures see informal network ties as the primary bases of social identity, conveying a sense of personal belonging within a collectivity and clear normative expectations associated with one's role. Yet a clear social identity is facilitated by smaller networks that display high closure and cohesiveness, not large networks full of structural holes. We suggest that when competing for career opportunities, a coherent and well-defined organizational identity—including clear and consistent expectations about one's role—may be no less important than knowing whom to consult for information and aid. Thus, the network structure most conducive to maximizing access to information, resources, and "brokerage" opportunities is not the structure most conducive to a clear social identity, and vice versa. This suggests the importance of examining how network structure and network content interact in shaping careers.

We develop this alternative conception of workplace networks and show how it illuminates our understanding of how network ties shape career mobility within organizations. We document empirically that the network structure most conducive to organizational advancement depends significantly on the content of the social tie involved. We consider the same informal ties analyzed by Burt: task advice, strategic information, "buy-in" (those who have "fate control" over

one's initiatives at work), social support, and mentorship. But rather than aggregating across these different types of ties, we develop hypotheses regarding how each type of network tie affects upward mobility.

THE INTERACTION OF NETWORK STRUCTURE AND CONTENT

Granovetter's (1973) pioneering work on the "strength of weak ties" showed the significance of social networks for mobility. Unlike the strong ties that bind cliques of individuals and primarily convey redundant, within-group information, weak ties are sources of new information because they bridge local cliques. Thus, the more weak ties an individual (hereafter "ego") has in his/her network, the more valuable the network is as a source of information.

Burt (1992) argues that it is more useful analytically to focus on the pattern of relationships among the people (hereafter "alters") to whom ego is tied. He argues that weak ties are a correlate, rather than a determinant, of the amount of unique information provided by ego's network. Ego derives unique information from a particular alter to the extent that alter is disconnected from others in ego's network. Burt uses the term *structural hole* to indicate the absence of connections among those in the network, arguing that the more structural holes surrounding ego, the more conducive ego's network is to mobility. We use the term *direct ties* to refer to ego's connections to those in his or her network and *indirect ties* to refer to ties among the alters in ego's network. The number of direct ties should have a positive effect on upward mobility within the organization, whereas, for a given size, the number of indirect ties should have a negative effect. That is, larger and less redundant networks should aid career advancement.

Although Granovetter (1973) emphasizes the information benefits that derive from a large, nonredundant network, Burt (1992) argues that structural holes yield control benefits as well, basing his argument on Simmel's (1955) conception of the *tertius gaudens* ("third who benefits"). When two individuals are suppliers or buyers of the same resource, a third individual can exploit the competitive relation between the other

two to play them off against one another. Even if two individuals are not vying for or proffering the same resource, the third can exploit the lack of connection by inducing a competition for his or her time. In both cases, the third's bargaining power is strongly impaired if the two network members are strongly interconnected. This proposition is echoed in the network literature on brokerage, although this literature tends to focus on contexts in which no formal authority relations link actors (e.g., Marsden 1982; Fernandez and Gould 1994).

Burt applies the same reasoning to individuals and career mobility within organizations. He argues that a subordinate can influence superiors if there is some uncertainty about who has ultimate decision-making authority, and this uncertainty is enhanced by there being many unconnected decision-makers. The greater the uncertainty about who has ultimate authority and whose preferences should be taken into account, the easier it is for a subordinate to play differing preferences off against each other and establish his or her own agenda as a solution to a "swirl" of conflicting demands. Thus, to maximize information and control, ego should maximize the size and nonredundancy of his or her network.

A strong market-based conception looms in the background of this theory. Ego's control over others is a function of the extent to which ego can play partners off against one another. Indeed, Burt (1980) initially applied this theory of control to firms and industries in the market context. There are important advantages to transforming a market-based theory of control into a general network theory applicable in diverse contexts. The high level of abstraction allows the researcher to focus on common network structures, processes, methods, and measures across disparate levels of analysis and social phenomena, such as interorganizational relations within corporate networks, competition across industrial sectors, influence patterns within political institutions, power struggles among organizational subunits, and citation patterns and career advancement within scientific communities. This type of formulation has advanced network theory and has aided the development of standard network measures and methods. Indeed, network ana-

lysts interested in careers often measure and discuss social networks in the same way, whether they are studying career processes and network ties within a particular organization or analyzing a representative sample of the labor force.

Nevertheless, in our view, a market-based theory of control obscures several fundamental features of informal networks in work organizations. In Burt's theory of control, relations are understood primarily as conduits of information and resources exchanged by actors in pursuit of instrumental objectives. While many ties in the organizational context serve as conduits for some resource, particularly access and information, informal ties also are crucial sources of organizational identity and social support, often valued for their own sake (Ibarra and Smith-Lovin 1997). By referring to ties as determinants of identity, we mean that informal social relations not only forge a sense of personal belonging, but also create and sustain a clear normative framework within which individuals can rationally determine which courses of action are in their interest.

The idea that social ties convey content other than material resource flows has received considerable attention in the literature on neighborhood and community ties (e.g., Wellman and Wortley 1990). However, researchers interested in network effects within organizations have neglected the implications of the diverse contents transmitted through informal ties at work. Obviously, many organizational ties, such as relations to supervisors and mentors, involve access to resources *and* conferral of social identity, insofar as normative expectations of superiors and mentors have strong implications for how an individual perceives his or her identity in the organization.¹ Indeed, Granovetter's (1985) notion of the "social embeddedness" of economic exchange seems to imply a significant overlap of individuals among networks that convey resource-based

¹ Recent work in the sociology of markets conceptualizes market networks as determinants of identity. For example, Podolny (1993) argues that market relations are important determinants of an organization's status. Here, however, we are primarily contrasting the organizational context with the vision of the market that underlies Burt's theory of control.

and identity-based content. Some types of information exchanged through a specific network tie, such as the performance feedback an employee may receive from and give to others, lie at the boundary between resource-based and identity-based content.

Although the boundary between resource-based and identity-based content is admittedly imprecise, the conceptual distinction is important because it illuminates how and why the effects of structural holes on career mobility within organizations should vary across different types of network ties. To the extent that ties convey information or resources, Burt's theory is generally correct: Large, sparse networks are more advantageous in mobility contests. However, to the extent that ties convey normative expectations and social identity, there are clear advantages to a more cohesive network. Conceptualizing networks in terms of *social capital* rather than in terms of autonomy, dependency, and brokering opportunities, Coleman (1990) discusses the advantages of social closure in an individual's network. A cohesive network conveys a clear normative order within which the individual can optimize performance, whereas a diverse, disconnected network exposes the individual to conflicting preferences and allegiances within which it is much harder to optimize. Burt (1992) acknowledges this same point: "Leisure and domestic clusters are a congenial environment of low-maintenance, redundant contacts. Efficiency mixes poorly with friendship" (p. 24). What Burt does *not* seem to acknowledge, however, is that in the organization, a dense, redundant network of ties is often a precondition for: (1) internalizing a clear and consistent set of expectations and values in order to be effective in one's role; and (2) developing the trust and support from others that is necessary to access certain crucial resources (political aid, sensitive information, etc.) and to implement strategic initiatives.

Coleman's (1990) argument finds support in the organizational literature on "boundary spanning." Boundary spanners are particularly susceptible to role conflict arising from differing and inconsistent expectations among multiple constituencies (Whyte 1949; Kahn et al. 1964; Spekman 1979; Van Sell, Brief, and Schuler 1981). Faced with contra-

dictory expectations, the boundary spanner experiences considerable stress, and each constituency grows increasingly suspicious that its needs are receiving less attention from the boundary spanner than someone else's needs. Role conflict is associated with individual-level maladies, such as less efficient and effective task performance and lower organizational commitment (Kahn et al. 1964:49).

Consider the implications of this line of reasoning for an individual's "buy-in" network—a network composed of those individuals whose support an actor needs in order to pursue initiatives successfully within the organization. Members of the buy-in network have normative expectations for how ego should allocate time and what goals ego should pursue. These expectations define the responsibilities of ego's position. If there are few alters in the buy-in network and they are cohesive, ego is likely to face a well-defined and consistent normative milieu within which to pursue his or her interests. In contrast, when ego is confronted with a diverse array of unconnected individuals with conflicting preferences and is *accountable to those individuals*, ego is less able to satisfy these multiple constituencies simultaneously and develop a coherent identity. Thus, we predict that a buy-in network replete with structural holes adversely affects ego's job performance, and hence mobility, as well as ego's well-being at work.

A second difference between Burt's vision of ties in the market and the social ties that arise within organizations concerns the distinction between actors and the formal positions they occupy within a social structure. In Burt's conception of the market, there are no formal positions independent of actors and their relations. Within organizations, however, ties and networks exist among formal positions, as well as among individuals. For example, organizations often characterize network connections among formal positions through work flow diagrams or organizational charts. These ties are independent of the individuals occupying particular positions. Other types of informal ties reflect interdependencies among positions but are colored by the personal relations between individuals. Consider, for instance, the task-related information network of a faculty mem-

ber who becomes a dean. Were we to diagram his or her network in terms of flows of electronic mail, we would certainly expect to see major differences in the size, composition, and structure of that network before and after assuming the administrative post. Put differently, because of task interdependencies, resource flows, and opportunities for contact associated with organizational roles, individuals to some degree “inherit” networks by virtue of their formal organizational positions.

Formal position is especially likely to circumscribe and structure network ties that transmit task-related information and resources. After all, the task-related information that ego can provide and that ego needs is largely determined by formal position, and the alters best situated to provide ego with task advice also depend on ego’s formal role. In contrast, informal ties of friendship and social support are likely to be discretionary, reflecting interpersonal attraction and trust, and therefore are less rigidly circumscribed by formal position. (Although formal position determines opportunities for contact with friends or sources of gossip that in turn influence what ties are actually formed, the *content* of such relationships depends less on the formal positions that ego and alter occupy than does the content of job-related ties, like task-advice ties.)

We hasten to emphasize that this distinction between ties that are “position-centered” or induced by organizational structure versus those that are “person-centered” or induced by interpersonal attraction and trust should not be overstated, as it is more a matter of degree than of kind. For example, some types of strategic information conveyed in the workplace depend, almost by definition, on ego’s and alter’s formal positions, whereas other types of (more diffuse) organizational “gossip” and political intelligence may be decoupled from formal organizational roles and depend on interpersonal attraction and trust.

Notwithstanding these empirical ambiguities, the underlying distinction is important because it has implications for how the value of ties changes over time. Ties based primarily on formal position are unlikely to be maintained after the individual shifts positions or are likely to be of limited value if

they are maintained. One tie that is usually not maintained when occupants of a position move is a formal reporting relation. If the occupant shifts horizontally within the organization, ego usually cannot maintain a reporting relation to the supervisor. The faculty member who becomes a dean illustrates a tie that can be maintained but loses its value after a change in organizational roles. The task-advice ties that were valuable sources of information for research or teaching are not likely to be contacts that can offer advice in the new administrative role. Thus, either because position-centered ties cannot be maintained after mobility or because their value declines after mobility, task-advice ties have little *portability*. In contrast, person-centered ties, such as those that convey gossip, social support, and deference, are more portable—they continue to provide value after ego has shifted positions because their content is not so closely linked to ego’s job. Whereas a major change in role is likely to disrupt or sever position-centered ties, it is less likely to influence person-centered ties, which are influenced more by changes in ego’s or alter’s life situations, values, temperaments, and other factors that influence interpersonal attraction.

Figure 1 summarizes these arguments. The axes of the figure are two dimensions along which network contents are distinguished. The vertical axis distinguishes ties that primarily link positions (reflecting job interdependencies) from those that primarily link persons (reflecting interpersonal attraction and trust). Positional ties tend to be updated naturally or to decline in value over time. For example, the value of a strong tie to someone with fate control over ego’s initiatives is likely to diminish sharply if ego takes on a new position, whereas person-to-person ties are unlikely to diminish because they are not closely linked to ego’s formal position. The horizontal axis distinguishes ties that convey resources from ties that convey identity or normative expectations. We agree with Burt that structural holes are beneficial for networks that are conduits of resources. However, for ties that are conduits of normative expectations or identity, structural holes are not beneficial to mobility. Indeed, if facing consistent expectations benefits job performance, then structural holes in identity-based

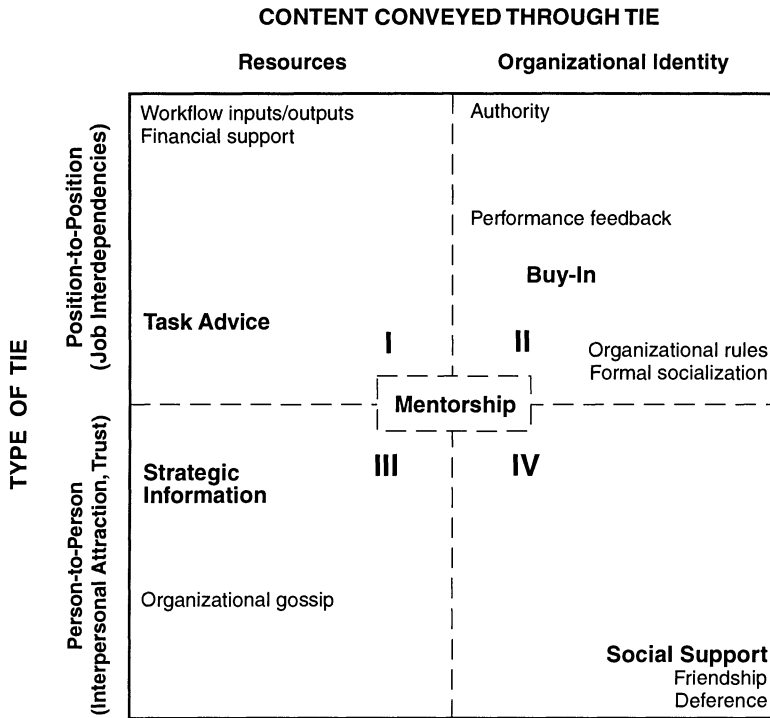


Figure 1. A Typology of the Content of Network Ties in Organizations

networks could *inhibit* performance, and hence inhibit mobility as well.

Each quadrant in Figure 1 contains examples of the content that might flow through ties. The position of each content within a quadrant reflects our informal assessment of how purely the content conforms to the characteristics of the quadrant. The closer a content is to the border of multiple quadrants, the more that we believe the content is an “intermediate type,” conveying some combination of identity and resources, or person- and position-centered contents.

The quadrants differ in terms of how significant the network contents are for job performance and mobility. Resource flows primarily linked to position (e.g., task advice) are clearly of instrumental significance to job performance. In contrast, flows of identity and expectations based on interpersonal attraction have the least instrumental significance. Although these ties may be important to work-related outcomes, such as satisfaction or turnover intentions, it is not clear why social support or friendship ties (absent any informational or resource content) should be

relevant to task performance. Quadrants II and III (person-centered resource flows and identity-based positional flows) are less clear cut. Some contents in these off-diagonal quadrants—relations to those with authority and access to certain kinds of strategic information, such as who is likely to be fired or receive more resources—could affect ego’s job performance. Other flows, such as generic company gossip, are probably less related to job performance.

Our analysis explores predictions implied by this typology, particularly how the effects of structural holes on mobility vary across types of network ties. We focus on five types of social relations that illustrate the diversity of informal ties observed in work organizations: task advice, strategic information, “buy-in” or “fate control,” social support, and mentorship. These networks were included in our network survey to maintain compatibility with Burt (1992) and other network research, rather than to capture maximal variation along the dimensions portrayed in Figure 1. Nonetheless, each of these networks of social relations—

with the exception of mentorship—represents one of the four quadrants in Figure 1. This lets us explore the usefulness of the conceptual distinctions that underlie Figure 1. Task advice and social support represent quadrants I and IV, respectively. Ties that involve strategic information (quadrant III) and “buy-in” (quadrant II) are somewhat more ambiguous. Clearly, flows of some types of strategic information within informal networks may be a result of the formal positions of ego and alter. However, in our network survey, strategic information was defined more like organizational gossip or “scuttlebutt,” which is based more on interpersonal attraction than on job interdependencies. We locate “buy-in” relations (ties to individuals with fate control over ego’s job-related initiatives) in quadrant II, because they derive from organizational position and transmit role expectations, organizational identity, and support. (Obviously, individuals with fate control may also be important sources of material resources, but this need not be the case—a coworker who is important socially or politically within the organization might be central in the “buy-in” network, even if that person is not a source of important material resources.)

The final tie, mentorship, could fit into several quadrants in Figure 1. An extensive literature examines how mentor relationships influence advancement, particularly for women and minorities (Marcus and House 1973; Kanter 1977; Burke and McKeen 1990; Ragins and McFarlin 1990; Thomas 1993). To date, this literature has produced little consensus, perhaps because mentorship involves multiple ties of disparate content. If mentorship is a source of resources, then the most valuable mentor tie would be to an alter who is not tied to ego’s other contacts (Burt 1992). However, mentors also provide friendship and social support and convey expectations about role performance and the progress of an individual’s career, thus representing a crucial determinant of organizational identity and belonging. How the mentor’s expectations correspond to the expectations of others who have authority or fate control over ego must be considered. Therefore, we distinguish between mentors who are in ego’s buy-in network and mentors who are not. A view of mentorship that

emphasizes the identity-based content of mentor-protégé ties rather than their task-related content suggests the opposite prediction from Burt’s structural holes argument: A mentor not in ego’s buy-in network represents a different constituency whose normative expectations must be appeased, thus undercutting ego’s ability to forge a clear organizational identity and signifying another potential land mine in the pursuit of upward mobility.

DATA, MEASUREMENT, AND METHODS

The Setting

To test these predictions, we examine the effects of different network contents on career mobility among exempt (i.e., salaried) personnel in a high-technology engineering and manufacturing corporation with approximately 25,000 employees worldwide in 1994. (Roughly speaking, exempt workers are those in professional and managerial positions.) The company, which grew considerably in the years prior to our study, had annual revenues of approximately 10 billion dollars in 1993. Though headquartered in California, the firm also has large establishments in several western states and has production facilities overseas. It is divided into three main operating divisions and several staff functions. Human resource representatives in the organization provided us with a random sample of 658 names of exempt employees drawn from two of the three main divisions. All employees in the sample were located in the United States at the time the sample was drawn.

A computer-administered questionnaire, approximately 30 to 45 minutes in length, was placed on computer diskette. We sent each of the 658 individuals a packet that included: (1) a letter, co-signed by a company human resources official, requesting the individual’s participation in the survey, assuring confidentiality, and providing instructions on how to start the survey; (2) a diskette containing the survey; and (3) a postage-paid mailer for returning the diskette upon completing the survey. After three weeks, we issued a follow-up letter reminding individuals of the survey, again request-

ing their participation if they had not yet completed the survey.

The survey was divided into three general sections. First, the respondent was presented with a set of name-generating questions that asked for the names or initials of the important individuals within his or her network.² In general, we used one name-generating question to define each type of network. Appendix A lists the five name-generating items relevant here.

To maximize comparability across studies, we drew extensively on the name-generating questions used by Burt (1992). Respondents could list up to five names in response to each name-generator, except that no more than two mentors could be listed. Respondents could list the same individual in response to the different name-generating items. Respondents who provided network information on five alters for a particular network were asked to estimate the number of additional alters who would meet the criteria implied by the name-generating question. This enabled us to gauge the percentage of respondents for whom we obtained reasonably complete network information (though we could not include these additional alters in the analysis because we did not obtain complete information on them).

The work force we studied, exempt employees of a high-technology firm, resembles the one analyzed by Burt (1992). The major differences are that our company is somewhat smaller than the company Burt analyzed, and our sample includes a broader spectrum of grade levels than Burt's did. Our sample is drawn from 10 grade levels, and only the two or three highest grades (approximately 10 percent of our sample) are comparable to the managers in Burt's sample. Nevertheless, we believe the similarities across the two samples outweigh the differences. By using a similar set of network measures in a similar organizational context, we are fairly confident that any differences in results reflect dif-

ferences in how we have specified network effects, rather than differences in samples, survey techniques, or name-generating items.

The second section of our survey asked respondents about the people they identified as being in their networks (e.g., gender, formal position, etc.) and the nature of each relationship (duration, closeness, frequency of contact). Respondents were also asked to identify strong ties among alters in their network, where strong ties were defined as relationships characterized by closeness and frequent contact (Marsden and Campbell 1984).

The third section of the survey asked respondents about their satisfaction and organizational commitment. Appropriate response categories and wording for questions in these sections were determined through extensive consultation with members of the firm's Human Resource department and by pretesting the survey instrument in the company.

We also were given access to company personnel information for all 658 persons in the target sample. These computer records included demographic information, career and performance appraisal history, and current salary. Using this information, we tested for selectivity bias in responses to our survey. Of the 658 surveys issued, we obtained usable responses from 236 individuals (36 percent).³ According to company officials, this response rate is comparable to what the firm achieves from its in-house pencil-and-paper surveys done on company time. This response rate was achieved despite the fact that our survey was more time consuming and was administered in an unfamiliar (computerized) format. Respondents were given the option of requesting a report of the research results and a printout comparing their personal networks to those of similarly situated employees at the company; 99 percent of the respondents requested this information.

We tested for selection bias on the basis of grade, occupation, division, race, gender, length of employment with the firm, past rate of mobility, and performance ratings. We found no evidence of selection bias on the basis of grade, occupation, division, gender,

² We anticipated that some employees might have concerns about the confidentiality of their survey responses, so the computerized questionnaire informed respondents that they could use consistent first names or initials in lieu of full names of people in their networks. In this way, the program could prompt the respondent for additional information on network members.

³ We received 240 surveys, but four diskettes were unreadable.

or length of employment with the firm. Employees with higher rates of mobility prior to the survey were slightly more likely to respond to the survey, while non-Whites were less likely than Whites to respond. Following the standard procedure for exploring sample selection bias (Berk 1983), we used logistic regression to compute the predicted probability of responding to the survey. We then tested whether inclusion of the predicted probability in our models affected our results. In no case was the effect of the selection variable significant, nor did its inclusion affect the magnitude or significance of any other coefficients. Therefore, although there is slight evidence of nonrandom responses to the survey, they have no discernible effects on the analyses reported here, and we excluded the selection instrument from the final analyses.

Dependent Variable: Grade Advancement

The survey was administered and the archival information collected beginning in January 1994; the bulk of the responses were received by March 1994. To analyze mobility, we model the probability of an exempt employee's experiencing a grade shift between March 1, 1993 and March 1, 1994, essentially the year prior to the administration of the survey. In this company, grade shifts do not necessarily imply job shifts. We focus on grade mobility rather than job mobility because it is extremely difficult to differentiate horizontal shifts from vertical job shifts in this firm independent of grade changes, whereas grade changes clearly signify upward advancement.⁴ Indeed, in this company, grade shifts invariably imply an increase in salary because each grade has a clearly defined salary range. Of the 229 individuals in our mobility analysis, 57 (25 percent) experienced at least one grade shift over the one-year period we analyzed.⁵

⁴ Several human resources personnel could not name their past or current job titles but knew their grade history. The fact that human resource specialists were unfamiliar with their formal job titles helped persuade us that grade-level changes were the meaningful career transitions to model in this organization.

⁵ We excluded from the mobility analyses 7 of the 236 employees who were nonexempt as of March 1993, because by definition these indi-

viduals must have experienced a move (into exempt status) to have been in the sample. In effect, inclusion of these 7 individuals would be tantamount to selecting on the dependent variable for this subgroup.

Given this measure of mobility, we excluded all ties in an individual's network that had a duration of one year or less. By excluding ties of duration shorter than the promotion window, we ensure that the direction of causality flows from the network to the promotion event rather than the reverse (cf. Burt 1992:173–80).⁶

Our approach requires two assumptions: (1) that no important ties in a respondent's network were severed during the one-year window, because alters would not have been named or described in the survey; and (2) each alter's function in ego's network remained reasonably stable over the duration of the window. For example, if an alter shifted from being a source of only task advice to a source of only strategic information, this change would not be reflected in our data. We believe these assumptions are not problematic for two reasons. First, the one-year window makes major changes in network composition unlikely.⁷ Second, and

viduals must have experienced a move (into exempt status) to have been in the sample. In effect, inclusion of these 7 individuals would be tantamount to selecting on the dependent variable for this subgroup.

⁶ We conducted supplementary analyses that included these short-duration ties formed after the start of the promotion window. In general, network effects on mobility *declined* when these short-duration ties were included. This suggests that the relationship between networks and mobility is properly specified. If network effects on mobility outcomes simply reflected some unobserved third factor (e.g., underlying abilities) and thus were spurious, then the observed relationship between network characteristics and mobility would not decrease with the inclusion of the short-duration ties. On the other hand, if mobility outcomes are a result of network effects, as we contend, then including these short-duration ties should weaken the observed effect because ties formed after a promotion obviously cannot *cause* that promotion.

⁷ To investigate the validity of this claim, we analyzed retrospective data we collected about respondents' networks in their first six months at the firm. In our sample, 23 individuals were hired in 1992. Comparing their initial (1992) information networks with current ones (January–March 1994) yields an estimate of how much change occurred in alters and in tie *contents* for a given ego-alter tie. These 23 individuals named 33 task-advice ties and 32 strategic-information ties in

even more important, to the extent that these assumptions *do* affect the results, they are likely to bias the results against our hypotheses by adding additional noise to the data.⁸

Independent Variables: Network Ties

Task-advice network. We examined three properties of ego's task-advice network—its size (number of direct ties), density (number of indirect ties among alters), and the duration of ego's ties to alters in the network. Size can range between 0 to 5, and the number of

indirect ties ranges from 0 to $\frac{N(N-1)}{2}$, where N is the size of the task-advice network. Because task advice is a resource flow, we predict that a large, less-dense task advice net-

their initial networks. Of the 33 initial task-advice ties, 27 (82 percent) remained in ego's current task-advice network. Of the 32 initial strategic-information ties, 22 (69 percent) were still intact. Moreover, of the 33 initial task advice ties, just four were "transformed" (i.e., became sources of only strategic information in the individual's current network). Of the 32 initial strategic-information ties, only 8 became sources of task-advice in the current network. Because recall bias is a concern, we regard this information as a rough guide to turnover and changes in content of ties. We also emphasize that these estimates are based on individuals who had been with the firm for no more than two years. Fewer changes in network composition and structure might be expected among employees who have been with the firm longer because their work assignments and social relations would be more stable. (Employees in our sample had an average tenure of 8.4 years.) Accordingly, the assumption that ties remained stable over a one-year period seems reasonable.

⁸ Note that our dependent measure differs significantly from Burt's. Burt (1992) analyzes two outcomes: "fast promotion," which measures the extent to which an individual is promoted to his or her current rank at a younger-than-normal age, and "early promotion," which measures whether an individual has been at the current rank longer than expected. Values for these mobility measures are affected by events that could occur *prior* to the formation of ties that constitute ego's current network. The network that Burt measures thus antedates much of the mobility captured in his dependent variables, making it difficult to see how the network could have *caused* the advancement that Burt analyzes. This is why we adopt the alternative approach just described.

work facilitates advancement. However, we have argued that task-advice networks are more position-centered than are strategic information networks—the task advice that ego needs and the task advice that an alter can provide are closely linked to their formal roles. Accordingly, we predict that task advice ties formed before ego's most recent grade shift (prior to our one-year promotion window) will be less valuable than those task-advice ties formed after ego's most recent grade shift. To test this hypothesis, we measured duration in two ways. First, we constructed one variable that is the average duration of ego's task-advice ties. Second, we divided network size into two components: the number of direct ties formed prior to ego's last grade shift before the one-year promotion window, and the number formed after that grade shift. Ties formed after the most recent grade shift should facilitate mobility, but those formed prior to this shift should have no effect (or possibly even a negative effect).

Strategic-information network. To generate strategic-information networks we asked respondents to name individuals "on whom [they] have relied for general information on the 'goings on' at [COMPANY]—people who have given you special insight into the goals and strategies of important individuals, divisions, or perhaps even the firm as a whole." Thus, this network taps flows of general organizational gossip. Because strategic information is a resource, we expect the value of the strategic-information network to increase with network size and sparseness (structural holes), as we predicted for the task-advice network. However, because we argue that organizational gossip networks involve predominantly person-to-person ties, the value of this network for mobility should not decline with average tie duration. This contrasts with our hypothesis for the task-advice network.

As with task advice, size of the strategic-information network can range from 0 to 5, and the number of indirect ties ranges from 0

to $\frac{N(N-1)}{2}$, where N is the size of the network. We also include the average duration of strategic-information ties to contrast the effects of tie duration in the strategic information and task advice networks.

Buy-in (fate-control) network. We argue that, net of the other ties we are examining, buy-in or fate-control ties convey organizational identity and normative expectations rather than constitute tangible resources. Accordingly, we predict that a small, dense fate-control network is more conducive to mobility than is a large, sparse network containing many unconnected constituents. As with the strategic-information and task-advice networks, size can range from 0 to 5, and the number of indirect ties in a network of size N can range from 0 to $\frac{N(N-1)}{2}$. We do not include a variable for average duration of the buy-in network ties because these ties are less discretionary than those in the information networks. The longevity of the buy-in network ties is a function of how long ego has been in a particular formal position in the organization (which our models do control for). These ties will be updated when an employee acquires a new formal position.

Unlike the task-advice or strategic-information networks, ego could cite an individual as someone whose buy-in is critical without the named alter necessarily being among ego's network of direct personal relations or friends. Accordingly, we include a variable that represents the average closeness to those in ego's fate-control network. Closeness is measured on a four-point scale: distant, not close, close, extremely close.⁹ We assigned equal-interval scores between 0 and 1 to these responses and calculated the mean closeness. We expect that closeness increases promotion chances. However, causality could run in the opposite direction: individuals might make inferences about their closeness to key decision-makers based on whether they had been promoted, assuming that once promoted they are "close" to those with authority or influence. Thus, causality for this variable is difficult to determine from our analysis.

We also included variables representing the size and number of indirect ties among those in the buy-in network. These variables allow us to adjudicate between Burt's (1992) structural holes argument and the opposite predictions derived from the research on boundary spanners and the literature empha-

sizing the identity-enhancing effects of small, dense networks.

Mentor relations. Our questionnaire limited the number of mentor ties to two. We distinguished between mentors inside and outside ego's buy-in network. If mentor ties are primarily conduits of resources, it should be beneficial to have a mentor who is outside of ego's immediate work setting and buy-in network because, as Burt (1992) argues, such a mentor provides nonredundant access. However, if mentor ties are primarily conduits for conveying normative expectations and organizational identity, then it should not be beneficial to have a mentor outside of ego's buy-in network because such a mentor is another constituency that ego must appease.

Friendship or social support relations. Quadrant IV in Figure 1 contains identity-based person-to-person ties that are unlikely to aid job performance directly. We did not predict any net effect of the social support network on mobility, and preliminary analyses confirmed this suspicion. However, including these variables inflated the standard errors of variables characterizing the strategic-information network because of a correlation between the features of the social support network and the strategic information network. (A moderately strong correlation between these two networks is not surprising given that both are person-driven rather than position-determined.) We therefore omit the social support network measures from our analyses.

Control Variables

Our analyses include additional controls, including three demographic attributes of respondents: race (non-White = 1), gender (female = 1), and age (in years).¹⁰ We include linear and quadratic terms for the amount of time an individual has been in the current grade (in years). (The mean duration in current grade is 2.61 years with a standard deviation of 2.46.) In alternative specifications,

¹⁰ Separate analyses for women and minorities found no systematic differences in network effects on mobility by gender or race. However, our sample included few women (47) and non-Whites (37), which may have limited our ability to detect such differences.

⁹ Respondents were given a one-sentence definition of each of these categories.

we also control for tenure in the organization, but when age and grade are included as controls, the effect of tenure is nonsignificant. (Most people enter this organization at approximately the same age and grade.)

We control for prior mobility in two ways. First, we calculate ego's rate of prior promotions by dividing the total number of grade promotions achieved before the beginning of the one-year promotion window by ego's tenure in the organization (in years) as of that date. (The mean number of grade shifts per year is .26 with a standard deviation of .21.) Second, we include a dummy variable indicating whether ego had *any* prior promotions within the company. This permits mobility chances for employees who have never been promoted in the past to differ discontinuously. These two measures capture the propensity for ego to have been promoted before our one-year promotion window, thereby controlling for any unobserved characteristics that could affect observed mobility. This makes for a strict test for network effects on mobility.

We also control for several aspects of ego's formal position in the company: grade, division, and occupation. The effect of grade is reported in the tables.¹¹ Controls for division (dummy variables) are included in the analysis, but their effects are not reported because they have little significance outside this particular organization. In other analyses (not shown), we also included controls for occupation, none of which approached statistical significance; they were therefore excluded from the final analyses.¹²

Methods

We modeled the probability of a grade advancement over the one-year promotion window using logistic regression. The outcome variable was coded 1 if the respondent re-

ceived a promotion over the one-year window, 0 otherwise.¹³

RESULTS

Descriptive statistics and bivariate correlations for the independent variables of interest are reported in Tables 1a and 1b and in Table 2, respectively. Table 1a indicates that most individuals reported content-specific networks that were no larger than five. Although a substantial minority (30 percent) named more than five network alters in their task-advice network (Table 1b), these results suggest that we obtained rather complete information on the networks of interest.¹⁴ Table 2 indicates that correlations among the size of the task-advice, strategic-information, and buy-in networks range from .34 to .49. Although statistically significant, these correlations are sufficiently low that each network can be considered reasonably distinct.

Table 3 reports the effects of social networks on grade mobility. For those coefficients for which there are contradictory hypotheses regarding their direction, we employ two-tailed tests of significance. For all others, we employ one-tailed tests. We do not report significance levels for control variables.

Consistent with Burt's (1992) structural hole hypothesis, the size of the strategic-information network in the full model (Model

to form particular types of network ties. If individuals of different ability levels form networks of different types, then observed network effects may reflect these ability differences. Our control for the rate of prior promotion reflects some of these unobserved differences, but including these earlier network variables provided an additional control for such differences. These early network variables had no significant net effects on mobility and therefore were excluded from the final analyses.

¹³ We conducted the analyses using the LOGIST procedure in SAS (version 6.07).

¹⁴ Concerned that there might be something distinctive about employees who have networks larger than five, we conducted supplementary analyses including dummy variables to indicate if a respondent would have named more than five alters for any of the name-generating items in the survey. None of these dummy variables had a statistically significant effect on mobility. Accordingly, they were excluded from the final analyses.

¹¹ Specifications incorporating a dummy variable for each grade did not improve on the reported (linear) specification.

¹² In analyses not reported here, we controlled for ego's task-advice relations, strategic-information relations, and mentor relations *during the first six months at the company*. Although respondents may not have recalled such information with perfect accuracy, we included these variables to control for ego's unobserved propensity

Table 1a. Descriptive Statistics for Types of Networks, by Network Size: Employees at a High-Tech-
nology Corporation, 1994

Size of Network	Type of Network							
	Task-Advice		Strategic- Information		Buy-In		Social Support	
	Number of Cases	Mean Indirect Ties	Number of Cases	Mean Indirect Ties	Number of Cases	Mean Indirect Ties	Number of Cases	Mean Indirect Ties
		among Alters		among Alters		among Alters		among Alters
0	15	0 (.00)	34	0 (.00)	51	0 (.00)	40	0 (.00)
1	34	0 (.00)	36	0 (.00)	40	0 (.00)	46	0 (.00)
2	46	.24 (.43)	44	.18 (.34)	46	.13 (.34)	71	.45 (.50)
3	43	.44 (.76)	53	.47 (.80)	38	.44 (.72)	37	1.22 (.91)
4	28	1.26 (1.22)	34	1.02 (1.10)	19	.79 (1.03)	25	1.60 (1.19)
5	69	1.37 (1.45)	35	1.22 (1.23)	42	1.44 (1.50)	17	1.52 (1.32)

Note: Numbers in parentheses are standard deviations; N = 236.

Table 1b. Additional Characteristics of Networks by Network Type: Employees at a High-Tech-
nology Corporation, 1994

Characteristic	Type of Network				
	Task-Advice	Strategic- Information	Buy-In	Social Support	Mentor
Mean size of network	3.04 (1.63)	2.52 (1.62)	2.25 (1.76)	2.05 (1.45)	—
Mean duration of direct ties	3.19 (2.58)	1.35 (1.85)	—	—	—
Number who would name more than five sources	58	34	35	17	—
Average closeness	—	—	.43 (.28)	—	—
Number who named at least 1 mentor	—	—	—	—	144
Number who would name more than 2 mentors	—	—	—	—	49

Note: Numbers in parentheses are standard deviations; N = 236.

4, Table 3) has a positive and statistically significant effect on the odds of grade promotion, whereas the number of indirect ties in this network has a significant negative effect. When an individual's rate of prior mobility is excluded (Model 3), the average duration of strategic-information ties has a positive, statistically significant effect on mobility.

After controlling for the rate of prior mobility, however, the effect is reduced considerably and is no longer significant (Model 4). Note that long-lived strategic information ties not only benefit ego's current mobility prospects, but also presumably play a role in ego's mobility. Therefore, it is not surprising that controlling for the rate of past mobility

Table 2. Correlations among Selected Independent Variables: Employees at a High-Technology Corporation, 1994 (N = 236)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
<i>Task-Advice Network</i>																			
(1) Size	1.00	.58	.38	.49	.32	.08	.40	.49	.36	.34	.25	.45	.54	.07	.12	-.10	.05	.12	.01
(2) Indirect ties	—	1.00	.15	.27	.41	.07	.26	.32	.61	.34	.10	.33	.61	.06	.02	-.01	.10	.07	-.01
(3) Average duration	—	—	1.00	.26	-.01	.40	.18	.18	.02	.10	.13	.19	.18	.18	.23	-.05	.09	.10	.06
<i>Strategic-Information Network</i>																			
(4) Size	—	—	—	1.00	.56	-.02	.34	.39	.28	.35	.24	.30	.40	.02	.10	-.02	.08	-.01	.11
(5) Indirect ties	—	—	—	—	1.00	-.11	.19	.19	.30	.25	.11	.33	.51	.12	-.11	.02	.09	.03	-.02
(6) Average duration	—	—	—	—	—	1.00	.06	.02	-.01	.02	.02	.13	.08	-.01	.12	-.15	.06	.08	.06
<i>Buy-In Network</i>																			
(7) Closeness	—	—	—	—	—	—	1.00	.69	.32	.50	.02	.20	.25	.10	-.01	-.04	.14	.11	.07
(8) Size	—	—	—	—	—	—	—	1.00	.55	.53	-.03	.22	.37	.12	.03	-.02	.20	.17	.06
(9) Indirect ties	—	—	—	—	—	—	—	—	1.00	.40	-.06	.25	.43	.04	-.02	.01	.10	.04	.10
<i>Mentor Relations</i>																			
(10) Mentor with buy-in	—	—	—	—	—	—	—	—	—	1.00	-.11	.15	.27	-.04	.06	.00	.09	-.10	.03
(11) Mentor without buy-in	—	—	—	—	—	—	—	—	—	—	1.00	.26	.21	-.13	.07	-.02	.02	-.07	.12
<i>Social Support Network</i>																			
(12) Size	—	—	—	—	—	—	—	—	—	—	—	1.00	.67	.09	.11	-.18	.09	.10	-.01
(13) Indirect ties	—	—	—	—	—	—	—	—	—	—	—	—	1.00	.14	.03	-.10	.08	.11	-.01
<i>Control Variables</i>																			
(14) Age	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	.01	-.12	-.27	-.10	.11
(15) Female	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	.06	-.26	-.10	.11
(16) Non-White	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	-.04	-.09	-.11
(17) Grade	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	.27	-.15
(18) Duration in grade	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00	-.30
(19) Rate of prior mobility	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.00

lessens the effect of tie duration. In effect, the rate of prior mobility is a proxy for how beneficial ego's long-lived strategic information ties have been in the past; once this proxy is included in the analysis, the direct effect of duration diminishes. Clearly, there is little evidence that the effects of strategic-information ties decline with duration. Rather, the value of this person-to-person tie appears to *increase* slightly with duration. This positive relationship may suggest the importance of trust—which presumably can only be established over time—for person-to-person ties.

Models 2 and 3 present alternative specifications for the effects of task-advice networks on grade mobility. Model 2 includes size (direct ties), indirect ties, and average duration of ties in the task-advice network. Size has a positive coefficient, although it is not statistically significant, whereas the number of indirect ties has a significant negative effect. Average duration has a negative coefficient that fails to attain statistical significance.

These results mask important differences, however, in the effects of long-lived versus short-lived task-advice ties. Model 3 divides the task-advice network into two components: ties formed before the last grade shift preceding the one-year promotion window and ties formed while in the respondent's current grade (as of the beginning of the promotion window). As we argued above, task-advice networks are likely to require significant updating after promotion, given the changes in duties and interdependencies associated with a higher position in the organization. Consistent with our argument, task-advice ties formed since the respondent's most recent grade shift have a positive and significant effect on subsequent mobility, whereas ties predating the most recent grade shift have a negative (but not statistically significant) coefficient during the one-year promotion window. Therefore, unlike person-centered strategic-information ties, position-centered task-advice ties show clear evidence of obsolescence following mobility. Both the positive effect of size and the negative effect of indirect ties are statistically significant in the fully specified model (Model 4). Based on Model 4, each additional task-advice tie formed after the most recent grade change more than doubles the odds of promotion

over the one-year window ($e^{.73} = 2.07$), whereas each additional indirect tie reduces promotion odds by a little more than one-half ($e^{-.84} = .43$). Given that the unconditional odds of an individual's being promoted over the one-year window are 1:3 (25 percent of the sample was promoted), these effects on the odds are substantial.

Consistent with the literature on boundary-spanning roles, the size of the buy-in network has a negative, statistically significant effect on mobility (Model 4), whereas the number of indirect ties among those within this fate-control network has a significant positive effect. Apparently, a lack of cohesiveness among those with fate control impedes advancement, in direct contrast to the prediction of Burt's *tertius gaudens* argument. Average closeness to those with fate control has a strong positive effect on mobility. We reiterate that this effect should be interpreted cautiously; a respondent could *infer* closeness to those in the buy-in network based on his or her own advancement.

The effects of mentor relations provide further evidence that structural holes among those with fate control diminish mobility. Model 1, which includes only the mentor tie variables, shows that a tie to a mentor within the buy-in network has a significant positive impact on the odds of grade mobility. There is no statistically significant difference in grade mobility between individuals with a mentor outside the buy-in network and those who did not name a mentor. Model 2 reveals that the positive effect of having a mentor in the buy-in network is largely spurious—when other network ties are included in the analysis, the effect of mentors becomes non-significant. Additional analyses (not reported here) revealed that the spuriousness reflects the strength of ego's connections to those in the buy-in network.¹⁵ In other words, having a tie to a mentor with fate control facilitates mobility, but no more so than having a relationship to *any* individual whose buy-in is critical. This spurious relationship implies that mentor effects on career mobility prima-

¹⁵ When ego's average closeness to those in the buy-in network is included in Model 1, the effect of having a mentor in the buy-in network is reduced by approximately one-half and becomes nonsignificant.

Table 3. Logistic Coefficients from the Regression of Grade Mobility on Measures of Network Type: Employees at a High-Technology Corporation, 1994

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Intercept	.34	(1.17)	.69	(1.32)	.31	(1.42)	-.70	(1.78)
<i>Task-Advice Network</i>								
Size	—		.19	(.19)	—		—	
Number of ties formed after most recent grade shift	—		—		.53 ⁺⁺	(.24)	.73 ⁺⁺	(.28)
Number of ties formed before most recent grade shift	—		—		-.13	(.22)	-.03	(.24)
Indirect ties	—		-.56 ⁺	(.34)	-.70 ⁺	(.36)	-.84 ⁺⁺	(.40)
Average duration	—		-.09	(.08)	—		—	
<i>Strategic-Information Network</i>								
Size	—		.64 ⁺⁺	(.22)	.66 ⁺⁺	(.21)	.60 ⁺⁺	(.23)
Indirect ties	—		-.50	(.34)	-.60 ⁺	(.36)	-.74 ⁺⁺	(.36)
Average duration	—		.16 ⁺	(.09)	.15 ⁺	(.09)	.08	(.08)
<i>Buy-In Network</i>								
Average closeness	—		1.71 ⁺⁺	(.79)	1.79 ⁺⁺	(.81)	1.68 ⁺	(.87)
Size	—		-.27	(.22)	-.30	(.23)	-.50 [*]	(.25)
Indirect ties	—		.92 [*]	(.38)	1.08 ^{**}	(.40)	1.00 [*]	(.41)
<i>Mentor Relations</i>								
Mentor in the buy-in network	.65 [*]	(.33)	-.22	(.48)	-.09	(.49)	.38	(.56)
Mentor not in the buy-in network	-.07	(.27)	-.40	(.33)	-.41	(.33)	-.70	(.37)
<i>Control Variables</i>								
Grade	-.15	(.12)	-.17	(.13)	-.17	(.13)	-.18	(.15)
Duration in grade	1.47	(.36)	1.68	(.41)	1.34	(.42)	1.61	(.47)
(Duration in grade) ²	-.16	(.05)	-.18	(.05)	-.16	(.05)	-.17	(.06)
Non-White	-.69	(.46)	-.71	(.51)	-.89	(.53)	-.15	(.60)
Female	.39	(.44)	.44	(.52)	.50	(.52)	.32	(.56)
Age	-.09	(.03)	-.10	(.40)	-.13	(.04)	-.12	(.04)
Rate of promotions prior to one-year window	—		—		—		2.11	(.69)
Any promotions prior to one-year window	—		—		—		2.13	(1.16)
Chi-square	46.00 ^{**}		74.80 ^{**}		82.00 ^{**}		104.86 ^{**}	
Degrees of freedom	10		19		19		21	
Percent concordant pairs	78.4		85.7		87.1		90.7	
Number of cases ^a	229		229		229		229	

^a Number of cases is 229 because 7 individuals were nonexempt employees (see note 5).

⁺*p* < .05 ⁺⁺*p* < .01 (one-tailed tests)

^{*}*p* < .05 ^{**}*p* < .01 (two-tailed tests)

rily reflect the mentor's authority or influence over decisions and initiatives in ego's department or office; there is little tangible benefit of a mentor on grade promotion independent of this ability. Put differently, it is being close to those with fate control, rather than having a mentor per se, that helps people get ahead.

Although having a mentor in the buy-in network has no independent effect on mobility chances, the fully specified model (Model 4) shows that having a mentor who is outside of the buy-in network actually has a *negative* effect on mobility chances that closely approaches significance ($p = .06$, two-tailed test). This result provides further evidence that dispersion of fate control impedes mobility chances. By trying to impress or placate a mentor who is disconnected from those who control one's fate, while also accommodating the interests and concerns of those in the buy-in network, an employee may perform in ways that displease *both* constituencies, thereby diminishing his or her future prospects.

CONCLUSION

We have documented how informal social ties affect advancement within a high technology corporation. In certain respects, our findings are consistent with those reported in Burt's (1992) pioneering study of a similar organization. Like Burt, we found that large information networks that lack indirect ties (i.e., are full of structural holes) promote upward mobility within the company. Our analyses also substantiate claims by Burt and other network structuralists (e.g., White, Boorman, and Breiger 1976; Mayhew 1980) that the *pattern or structure* of social relations is a meaningful determinant of an individual's fate, including intraorganizational advancement.

However, by disaggregating social ties into specific types, we have shown that Burt's predictions apply only to a restricted class of network contents. Among position-centered resource flows, it is necessary to be sensitive to the duration of ties—simply adding up the number of structural holes in the network leads to a misspecification of the network effect on mobility because the value of some of these holes clearly diminishes when ego

changes positions. More significantly, within buy-in networks, structural holes have a *negative* effect on mobility. Supplementary multivariate analyses (not reported here) revealed that job satisfaction was lowest, all else being equal, among those whose buy-in networks were the largest and displayed the most structural holes, as would be predicted by the boundary-spanning literature and the identity-based approach to networks. Perhaps it can be said that all structural holes are not of the same color; some are “white holes,” propelling the individual upward through the organization and providing socioemotional benefits, while others are clearly “black holes,” holding individuals at a particular rank in the organization and causing negative psychological consequences.

Given our finding that the effects of structural holes on promotion are positive for ties that convey resources and information and negative for ties that transmit identity and expectations, the standard practice in network research of aggregating disparate kinds of ties when relating network structure to mobility outcomes seems ill-conceived.¹⁶ Indeed, Burt (1995) reanalyzed his data decomposing his aggregate network into two

¹⁶ In supplementary analyses, we adopted Burt's approach and calculated aggregate measures of network size and structure. There was no net effect of overall network size or structure on mobility. Why did Burt (1992) find an effect of structural holes for his aggregated network measure and we did not? Perhaps the difference reflects differences between the two organizations and samples studied. Burt's sample consisted of senior managers for whom issues of organizational identity and belonging may no longer be salient for career advancement, whereas our sample was more heterogeneous. Another explanation may rest in methodological differences between the two studies. Whereas we examine mobility events that occur after the formation of an individual's network, Burt examines the relationship between an individual's *current* aggregate network and that individual's total mobility since entering the firm. Since much of an individual's mobility may occur prior to the formation of the network, Burt's specification of the relationship opens up the possibility of reverse causality. That is, a high rate of mobility may determine the formation of subsequent structural holes. Such reverse causality would increase the possibility of a statistically significant relationship between the aggregate network and an individual's mobility.

disaggregated networks—a network pertaining to resource flows and a network pertaining to authority relations. With the overall network disaggregated in this fashion, structural holes in the resource-based network had a positive effect on mobility, but structural holes in the authority network did not.

We suggested that when applying the structural hole hypothesis to organizational contexts (including mobility contests), the disparate contents conveyed through informal social ties must be situated within a broader conceptual framework. We emphasize two dimensions along which social ties in work organizations vary: (1) whether the tie is principally a conduit of task-related information and resources rather than a means of transmitting role expectations, an organizational identity, and a clear sense of belonging; and (2) whether the tie is primarily a link among positions, reflecting task interdependencies and the exigencies of the division of labor, or among individuals, reflecting processes of interpersonal attraction and trust. Although the hypotheses we tested were broadly consistent with our findings, the specific types of network ties we studied were selected to parallel previous studies in this field, not to provide an optimal representation of the conceptual space portrayed in Figure 1. Future theoretical and empirical work on networks can validate and refine our typology and improve our understanding of the contours and consequences of different types of content that flow through informal social ties.

Indeed, we believe our typology casts light on some disconfirming evidence regarding the structural holes hypothesis that Burt unearthed in his own study. Burt (1992) reported that mobility among female managers and entry-level male managers was enhanced by building hierarchical networks around a strategic partner and by building dense ties to the immediate work group, rather than by maximizing structural holes and brokerage opportunities. Burt writes that this “speaks to their more defensive positions in the firm” (1992:157). Stated another way, it is especially important for women in the senior management ranks of a technology company, as well as entry-level male managers, to forge clear organizational identities and to internalize a coherent set of normative expectations about their organizational roles.

For these organizational “neophytes,” resolving identity concerns may be of greater moment than maximizing access to information, resources, and brokerage opportunities.

Extending this line of argument, one could test a set of hypotheses about how the benefits of structural holes versus dense cohesive networks vary not only with the content of ties but also cross-culturally (particularly between individualistic and collectivist cultures), across organizational contexts (e.g., in traditional bureaucratic firms, where structural holes may be most beneficial, versus strong culture organizations, where a sense of belonging and a clear organizational identity may be crucial), among different types of occupations (e.g., as a function of demographic composition and degree of technical interdependence), and in response to ascriptive characteristics, tenure, and other individual attributes. Such investigations into the boundary conditions around structural hole effects represent a promising direction for future research.

More broadly, our approach to networks calls into question the instrumentalist, strategic conception of social networks implicit in most research relating social networks to mobility. Many important informal ties in organizations are a result of ego’s and alter’s positions within the organizational division of labor and are therefore only minimally controllable by the actors involved. Moreover, individuals seek not only resources and information through social networks, but also a sense of belonging and an understanding of what is expected of them, and sometimes the very same tie (e.g., to a mentor or supervisor) can be a source of both resource-based and identity-based flows. Consequently, individuals are highly constrained in their ability to form a network that is maximally efficient with respect to some property, such as the number of structural holes.

The sources of constraint within organizations are numerous. One source of constraint is the opportunity to form new ties. For instance, it may not be possible to form new mentor relations to individuals with buy-in; therefore, ego may retain a relationship with a prior mentor that continues to provide socioemotional benefits even if the mentor’s value for future mobility is limited (or even negative).

A second source of constraint follows from the first. To the extent that ego has limited opportunities to form ties, he or she may rely on the same ties for multiple contents (e.g., receiving task advice, strategic information, and social support). Such “multiplex” ties may constrain the individual’s ability to maximize his or her network with respect to any particular content. If an individual receives multiple contents from the same individual, it may be difficult to drop one content without dropping the other. For example, if ego goes to a given alter for strategic information, social support, and buy-in, it will obviously be quite difficult to withdraw the strategic information component of the relationship without risking the loss of the tie altogether. Yet as we have seen, structural holes in the strategic information network facilitate ego’s mobility, whereas structural holes in ego’s buy-in network have the opposite effect. Thus, if the two networks overlap substantially, ego will by definition have to live with suboptimal networks in both domains.

A third source of constraint is that individuals may experience negative reputational consequences in an organization by dropping person-to-person ties that are no longer valuable. As Burt (1992) colorfully writes, “Judging friends on the basis of efficiency is an interpersonal flatulence from which friends will flee” (pp. 24–25). If ego is perceived as dropping ties and renegeing on implicit obligations when a relation is no longer valued, others may be less willing to form ties with ego. Put another way, the individual may need to preserve ties that are no longer instrumentally valuable because of norms against the breaking of ties.

The presence of such constraints calls into question the value of conceptualizing workplace networks in highly strategic and volun-taristic terms. A promising direction for future research involves examining stability and change in various types of social ties in order to understand how individuals adapt to these constraints and manage the trade-offs they imply. What structural or demographic factors affect an individual’s opportunities to form new ties? What factors account for the rate of change in the number, structure, and composition of different types of informal ties? Are some types of relations (e.g., friendship and strategic information) more

persistent than others? How and why do employees vary in the extent to which their workplace networks are “multiplex” versus being compartmentalized across specific domains or types of relations? Why do some groups of employees have more diverse and expansive networks than others? Research along these lines should illuminate the relative importance of organizational constraints versus employees’ strategic choices in shaping social ties, and should provide additional insight into how informal social relations affect mobility and satisfaction in the workplace.

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Appendix A. Name-Generating Questions Used in Computerized Questionnaire

The following name-generating questions, which closely follow Burt (1992), were used to obtain information on ego’s current network:

Task advice Over the last six months, are there any work-related contacts from whom you regularly sought information and advice to enhance your effectiveness on the job?

Buy-in Suppose you were moving to a new job and wanted to leave behind the best network advice that you could for the person moving into your current job. Are there any individuals whom you would name to your replacement

	whose "buy-in" is essential for initiatives coming out of your office or department?
Strategic information	Thinking back over the past six months, are there any individuals on whom you have relied as sources for general information on the "goings-on" at [COMPANY NAME]—people who have given you special insight into the goals and strategies of important individuals, divisions, or perhaps even the firm as a whole?
Mentor	Are there any individuals whom you regard as a mentor—that is, someone who has taken a strong interest in your professional development over the last six months by providing you with opportunities and/or access to facilitate your career advancement?
Social support	Is there anyone in your work environment over the last six months whom you regard as a source of social support—that is, someone with whom you are comfortable discussing sensitive matters?

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