

## The ties that lead: A social network approach to leadership

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### Abstract

This article investigates, for leadership research, the implications of new directions in social network theory that emphasize networks as both cognitive structures in the minds of organizational members and opportunity structures that facilitate and constrain action. We introduce the four core ideas at the heart of the network research program: the importance of relations, actors' embeddedness, the social utility of connections, and the structural patterning of social life. Then we present a theoretical model of how network cognitions in the minds of leaders affect three types of networks: the direct ties surrounding leaders, the pattern of direct and indirect ties within which leaders are embedded in the whole organization and the interorganizational linkages formed by leaders as representatives of organizations. We suggest that these patterns of ties can contribute to leader effectiveness.

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Good administrators sometimes fail to understand social structure, and fail to anticipate its consequences for organizational survival. This can leave organizations vulnerable to manipulation by skilled political entrepreneurs. In one example, the entire top management team of a manufacturing company learned from a network analysis that the bomb threats, shootings, and vandalism threatening the future of the company were instigated by partisans of a lower-ranking manager, who had had systematically recruited family, friends and neighbors into the company over a 30-year period. In a district desperate for jobs, these partisans felt loyalty to the informal leader who had provided them information that allowed them to be first in line for vacancies on Monday morning. The CEO, confronted with an analysis of the deep cleavages existing in the social structure of the organization resulting from the informal patterns of recruiting over decades, had this to say about those who had been hired: "... they just seemed like waves of turtles coming over the hill; hired as they made it to our door" (Burt, 1992: 1).

This story illustrates the gap at the heart of our understanding of leadership. It illustrates how important it is for would-be leaders (who may or may not hold formal supervisory positions—see Bedeian & Hunt, [in press](#)) to accurately perceive the network relations that connect people, and to actively manage these network relations. This story also

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illustrates how informal leaders who may lack formal authority can emerge to frustrate organizational functioning through the manipulation of network structures and the exercise of social influence. The perception of and the management of social networks are intrinsic to the leadership role as we define it in this article, but reviews of the social network literature frequently point out that “little empirical work has been done on leadership and social networks” (Brass, Galaskiewicz, Greve, & Tsai, 2004, p. 800). Our goal is to investigate, for leadership research, the implications of new directions in network theory that emphasize networks as both cognitive structures in the minds of organizational members and opportunity structures that facilitate and constrain action.

In making the link from social networks to leadership, we borrow freely from the entire corpus of social network theory (see Kilduff & Tsai, 2003, for a recent review) and from two perspectives in recent leadership theory: the cognitive revolution in leadership research (Lord & Emrich, 2001) and the theoretical and empirical work that seeks to extend the leader–member exchange (LMX) perspective (e.g., Graen & Uhl-Bien, 1995; Liden, Sparrowe, & Wayne, 1997; Sparrowe & Liden, 1997, *in press*; Uhl-Bien, Graen, & Scandura, 2000). The cognitive approach to leadership draws attention to the fundamental importance of cognitive structures, such as schemas, in shaping leadership attitudes and behaviors, whereas the LMX approach draws attention to the importance of relations, particularly the dyadic link between a formally designated managerial leader and either a subordinate or, more rarely, a higher-level leader (see Graen & Scandura, 1987, for a review). We build a model that emphasizes, from a network perspective, how the cognitions in the mind of the individual influence the network relationships negotiated by the individual, and how this individual network affects leadership effectiveness both directly and through informal networks, both within organizations and across organizations. Thus, we link together social cognitions and social structure to forge a distinctive network approach to leadership that builds upon, but extends, previous work in both the network and the leadership realms.

## 1. Organizational network research core ideas

The organizational network perspective is a broad-based research program that continually draws inspiration from a set of distinctive ideas to investigate new empirical phenomena. The “hard-core” ideas at the heart of network research define its special character and distinguish it from rival research programs (cf. Lakatos, 1970). What are these ideas familiar to all organizational network researchers? At least four interrelated principles generate network theories and hypotheses: the importance of relations between organizational actors, actors’ embeddedness in social fields, the social utility of network connections, and the structural patterning of social life (Kilduff, Tsai, & Hanke, 2005).

An emphasis on *relations between actors* is the most important distinguishing feature of the network research program. As a recent historical treatment of social network research (Freeman, 2004, p. 16) pointed out, a core belief underlying modern social network analysis is the importance of understanding the interactions between actors (rather than a focus exclusively on the attributes of actors). An early treatment of network research on organizations stated that “the social network approach views organizations in society as a system of objects (e.g., people, groups, organizations) joined by a variety of relationships” (Tichy, Tushman, & Fombrun, 1979: 507), whereas a more recent survey represented organizational network research as a movement “away from individualist, essentialist and atomistic explanations toward more relational, contextual and systemic understandings” (Borgatti & Foster, 2003: 991). The importance of understanding relationships as constitutive of human nature was stated as follows in a recent book: “Human beings are by their very nature gregarious creatures, for whom relationships are defining elements of their identities and creativeness. The study of such relationships is therefore the study of human nature itself” (Kilduff & Tsai, 2003: 131). Our network approach locates leadership not in the attributes of individuals but in the relationships connecting individuals.

The second principle that gives organizational network research its distinctiveness as a research program is the emphasis on *embeddedness*. For organizational network researchers, human behavior is seen as embedded in networks of interpersonal relationships (Granovetter, 1985; Uzzi, 1996). People in organizations and as representatives of organizations tend to enter exchange relationships, not with complete strangers, but with family, friends, or acquaintances. Embeddedness at the system level can refer to a preference for interacting with those within the community rather than those outside the community. We emphasize that people’s perceptions of others as leaders are reflected through the sets of embedded ties within which people are located.

The third driving principle of social network research is the belief that network connections constitute *social capital* that provides value—including economic returns (Burt, 2000). As a previous review of network research on leadership

pointed out, “Social capital is at the heart of social network analysis” (Brass & Krackhardt, 1999: 180). Depending upon the arrangement of social connections surrounding an actor, more or less value can be extracted (Burt, 1992; Gnyawali & Madhavan, 2001). At the system level, a generalized civic spirit emerges from and contributes to the many interactions of trust and interdependence between individual actors within the system (Coleman, 1990; Portes, 2000). Leadership, from the network perspective we develop, involves building and using social capital.

The fourth leading idea distinctive to the social network research program—the emphasis on *structural patterning*—often leads social network research to be referred to as the “structural approach.” Network researchers look for the patterns of “connectivity and cleavage” in social systems (Wellman, 1988: 26). Not content with merely describing the surface pattern of ties, researchers look for the underlying structural factors through which actors generate and re-create network ties. At the local level surrounding a particular actor, the structure of ties can be described, for example, as relatively closed (actors tend to be connected to each other) or open (actors tend to be disconnected from each other) (Burt, 1992). At the system level, organizational networks can be assessed for the degree of clustering they exhibit and the extent to which any two actors can reach each other through a short number of network connections (e.g., Kogut & Walker, 2001). To understand who is a leader from a network perspective is to investigate the social-structural positions occupied by particular individuals in the social system.

These four leading ideas—the importance of relationships, the principle of embeddedness, the social utility of network connections, and the emphasis on structural patterning—provide the common culture for organizational network research that allows the diversity of viewpoints from which fresh theoretical initiatives emerge (cf. Burns & Stalker, 1961: 119). Network research is also characterized by vigorous development of methods and analytical programs to facilitate the examination of phenomena highlighted by theory (see Wasserman & Faust, 1994 for a review of methods; and the UCINET suite of programs—Borgatti, Everett, & Freeman, 2002—for statistical software). Our review in this article will touch on these methodological developments where appropriate.

The organizational network research program is progressive in the sense that new theory is constantly being developed from the metaphysical core of ideas that makes up the heart of the research program, highlighting new areas of application. It is the purpose of this review to highlight the area of leadership from a network perspective. The four leading ideas that comprise the intellectual source of theory development for organizational network research are best understood as mutually reinforcing core beliefs that, like the planks of a ship, keep the research program afloat—in terms of new theory development and exploration of new phenomena. At the level of network theory and research, all four ideas tend to be inextricably involved. We will invoke these ideas as appropriate throughout this review.

In contrast to network research, traditional leadership research has focused on human capital attributes of leaders and situational attributes of leadership contexts. Human capital attributes of leaders include traits (e.g., House, 1977; Kenny & Zaccaro, 1983) and behavioral styles (e.g., Lewin, Lippitt, & White, 1939; Podsakoff, Todor, & Skov, 1982); whereas situational attributes of leadership contexts include task structure (Fiedler, 1971), the availability of leadership substitutes (Kerr & Jermier, 1978), the nature of the decision process (Vroom & Yetton, 1973) and the quality of leader–member exchange (Dansereau, Graen, & Haga, 1975; Graen, Novak, & Sommerkamp, 1982). A social network perspective does not eclipse the valuable results of conventional leadership research; rather, a network perspective can complement existing work without repeating it. In particular, in this review we amplify the voices that have called for a new understanding of leadership effectiveness to include leaders’ cognitions about networks and the actual structure of leaders’ ties (e.g., Hooijberg, Hunt, & Dodge, 1997; see also Bass, 1990: 19).

As with all theoretical perspectives the network approach has boundary conditions that limit its range of application. Social network processes are less likely to have the effects we discuss to the extent that organizations are characterized by perfect competition between equally informed actors all of whom have the same opportunities (see the discussion in Burt, 1992). (Even under conditions of perfect information, however, some actors are likely to be more influenced by social networks than others—see Kilduff, 1992.) A further limiting condition is the extent of work interdependence: under conditions of low interdependence between actors and little or no social interaction, network processes and their effects will tend to be minimized.

In network terms, leadership embodies the four principles that we articulated earlier. Leadership can be understood as *social capital* that collects around certain individuals—whether formally designated as leaders or not—based on the acuity of their social perceptions and the structure of their social ties (cf. Pastor, Meindl, & Mayo, 2002). Patterns of informal leadership can complement or complicate the patterns of formal leadership in organizations. Individuals can invest in *social relations* with others, can structure their social networks by adding and subtracting relationships, and can reap rewards both in terms of their own personal performance and organizational unit performance (Sparrowe,

Liden, Wayne, & Kraimer, 2001). But *embeddedness* in social networks always involves the paradox that social relations, particularly those outside the immediate circle of the individual, may be difficult both to perceive accurately and to manage (cf. Uzzi, 1997). Thus, although the *social structure* of the organization determines opportunities and constraints for emergent leaders, the social structure is not within the control of any particular individual.

## 2. Leadership and the structure of ties

We start our network approach to leadership theory with a discussion of actor cognitions concerning networks, move out to the inner circle around the actor and then further zoom out to include progressively more of the social structure of the organization and the interorganizational realm (see Ibarra, Kilduff, & Tsai, 2005, for more on the “zooming” metaphor in relation to network research). The theoretical framework is illustrated in Fig. 1, and represents a tentative model of leadership effectiveness from a network perspective. We provide an overview of the causal connections of the model before zooming in to discuss in more detail the dynamics within each part of the model.

As Fig. 1 shows, the first step in our conceptual model indicates that leaders’ cognitions about social networks affect the “ego networks” that surround each leader. Cognitive network theory (see Kilduff & Tsai, 2003, pp. 70–79, for a review) suggests that people in general shape their immediate social ties to others to be congruent with their schematic expectations concerning how relationships such as friendship and influence should be structured. The schematic expectations of leaders affect their ability to notice and change the structure of social ties (e.g., Janicik & Larrick, 2005). Thus, cognitions in the mind of the leader are the starting point for our theorizing concerning the formation of ties connecting the leader to others.

The network cognitions of leaders concerning such crucial organizational phenomena as the flow of social capital within and across organizational boundaries, and the presence and meaning of social divides, are hypothesized to affect the extent to which leaders occupy strategically important positions in the organizational network. An accurate perception of the informal influence network can itself be a base of power in the organization (Krackhardt, 1990) and can facilitate the leader’s ability to forge successful coalitions (Janicik & Larrick, 2005). We extend these insights to hypothesize that the acuity of leader cognitions will affect the extent to which a leader plays a strategically important role in the relevant interorganizational network. We know of no research bearing on this thesis, although recent work concerning interorganizational relationships increasingly concerns itself with hypothesized perceptual processes such as organizational reputation and status (e.g., Podolny, 1998; Zuckerman, 1999).

The extent to which a leader plays a role in these three actual networks—the ego network, the organizational network and the interorganizational network—is hypothesized to affect leader effectiveness. This critical hypothesis derives from our basic understanding of how the four guiding principles of the network approach extend leadership theory. Modern concepts of leadership identify the relational content of the interaction between people as the key aspect involved in the structuring of situations and the altering of perceptions and expectations (e.g., Bass, 1990, p. 19). Modern network theory suggests that individuals who are central in the immediate networks around them and in the larger networks that connect them to others throughout the organization and beyond the organization are likely to acquire a particular type

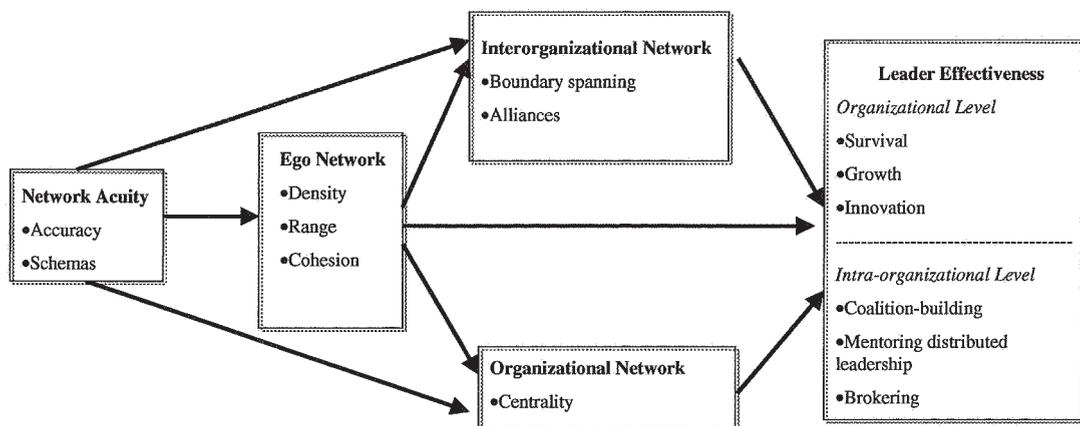


Fig. 1. Theoretical framework linking leader’s network accuracy to leader-relevant outcomes.

of expert power-knowledge of and access to those few powerful others whose words and deeds control resource flows and business opportunities (e.g., Burt, 2005). Leaders may not be able to move into the center of every important network, of course. Embeddedness in one social network may come at the price of marginality in another network. There are trade-offs involved in building social capital, particularly when brokerage across social divides may engender distrust rather than gains.

One blow-by-blow account of an organizational power struggle contrasted the networking strategies of two combatants for sole control of the CEO position they currently shared. Whereas co-CEO Louis Glucksman was central within the Lehman Brothers organization as a whole and occupied a particularly strategic position among the traders, his rival and co-CEO Pete Petersen neglected internal networking in pursuit of connections with the leaders of other organizations (Auletta, 1986). Both men were effective leaders—Glucksman contributing to internal effectiveness and Petersen building and maintaining the external relationships that brought contracts to the partnership. But both had built quite different social network bases of power.

The role of external affective ties with the representatives of other organizations in providing vital help to companies in financial trouble has been emphasized by research on the survival prospects of small firms in the New York garment industry (Uzzi, 1996). More generally, the organizational theory and strategy literatures have examined the extent to which ties between organizations constitute a knowledge base important for outcomes such as firm growth (e.g., Powell, Koput & Smith-Doerr, 1996), new ties (e.g., Gulati & Gargiulo, 1999; Larson, 1992), and innovation (Hargadon & Sutton, 1997). Thus, the extent to which leaders are effective in terms of accessing important resources is likely to depend on the social-structural positions they occupy in the key networks within and between organizations.

What are the outcomes associated with leader effectiveness from a social network perspective? We have mentioned above such aspects of leader effectiveness as organizational growth, survival, and innovation. These are the responsibility of formal leaders and are outcomes at the organizational level of analysis. As Fig. 1 summarizes, leader effectiveness from the network perspective we articulate would also include such components of internal organizational functioning as coalition building, mentoring, and brokering. These are intrinsically networking outcomes of both formal and informal leadership that can enhance coordination across functions within the organization. We return to these internal measures of leader effectiveness later in the paper.

The model outlined in Fig. 1 necessarily simplifies the relationships between cognition, social networks, and leadership effectiveness. We neglect, for example, the ways in which occupancy of social structural positions in networks affects individuals' cognitions and expectations about networks (see Ibarra et al., 2005, for a review). The organization and the environment within which it operates can be jointly considered a set of cyclical processes captured in networks of cognitions (cf. Bougon, Binkhorst, & Weick, 1977). We focus in this article on leadership, and therefore emphasize the proactive enactment of outcomes leading to leader effectiveness.

### 3. Network cognition and leadership

A key discovery of modern social network research is that cognitions matter (e.g., Kilduff & Krackhardt, 1994), and thus we start the in-depth discussion of the theoretical framework with an emphasis on network cognition, a topic relatively neglected within conventional leadership research (but see early LMX work on whether peers within units accurately perceive the quality of dyadic leader–subordinate relations—Graen & Cashman, 1975). Depending upon how the boundary is drawn around a particular individual in an organization, that individual may or may not appear to be influential in the eyes of others. That implicit leadership theories may be triggered by the structural position of certain individuals in the eyes of others is a possibility hinted at in recent leadership theory (Lord & Emrich, 2001), but yet to be systematically examined. From the perspective of perceivers located in small groups, certain actors may appear influential, but perceivers surveying the larger context of the whole organization may dismiss these same actors as relatively inconsequential (see the discussion in Brass, 1992). Conversely, people who seem relatively powerless within one local group may be revealed to have close connections with powerful others outside the group. Thus, we organize our discussion by progressively zooming out from individuals' network cognitions to include expanding social circles within and beyond the organization.

From a network perspective that emphasizes the importance of relationships, embeddedness, social capital, and social structure, the ability of formal or would-be informal leaders to implement any leadership strategy depends on the accurate perception of how these principles operate in the social context of the organization. To be an effective leader of a social unit is to be aware of: (a) the relations between actors in that unit; (b) the extent to which such relationships

involve embedded ties including kinship and friendship; (c) the extent to which social entrepreneurs are extracting value from their personal networks to facilitate or frustrate organizational goals; and (d) the extent to which the social structure of the unit includes cleavages between different factions. The accurate perception of this complex social reality is fraught with difficulty, and, therefore, network cognition is an arena for innovative research.

If a leader wants to use social network ties to lead others, the leader must be able to perceive the existence, nature, and structure of these ties—not just the ties surrounding the leader, but the ties connecting others in the organization both near and far. Actors who are perceived to have power in terms of the structure of their social ties to others may wield influence even though they seldom or never exercise their potential power (Wrong, 1968; see the discussion in Brass, 1992: 299). To a considerable extent, organizations and environments exist as cognitions in the minds of leaders and followers within organizations (Bougon et al., 1977; Kilduff, 1990) and in the inter-organizational arena of reputation and status (Podolny, 1998; Zuckerman, 1999).

Thus, the question arises, how do people perceive network ties within and between organizations? How does anyone tell whether, for example, two individuals are personal friends? Even a small organization of 50 people represents a considerable cognitive challenge in terms of trying to perceive accurately the presence or absence of 2450 friendship links between all pairs of individuals, links that may well be relatively invisible except to the individuals concerned. To create and manage the networks that promote leadership effectiveness, it may be necessary to possess an accurate representation of network links involving not just friendship and kinship, but also advice, communication and other important network ties.

What happens when formal leaders pay no attention to the four principles we have enunciated as representing the network approach to leadership? Is there any penalty consequent upon leader ignorance of social relations inside organizations, leader blindness to the embeddedness of working relationships in extra-organizational arrangements such as kinship, leader neglect of the extent to which social entrepreneurs manipulate embeddedness for their own ends, and leader unconsciousness of the social cleavages within the organization? The answer, provided in the case study alluded to in the opening paragraph of this article, is shocking in its illustration of diseased social capital. When the management fired, in a routine cost-cutting exercise, the informal leader to whom so many people were beholden not just for jobs but for the references necessary to actually get jobs inside the industrial plant, deep trouble ensued between employees loyal to the informal leader and those helping the management keep the industrial plant solvent. Shootings, bomb threats, and leakings of confidential management documents were the order of the day. The formal leadership team had no comprehension of what was happening, not having noticed that the workforce included so many people with strong social ties to a particular individual. (For the full case study see Burt & Ronchi, 1990.)

The CEO in this case was a good administrator and a skilled engineer who failed to understand the necessity of keeping track of the social structure of competition within and outside the organization. Social networks interpenetrate the boundary between employees and non-employees, and the management of this boundary has important consequences for organizational functioning. Job applicants with social contacts (such as friends) inside the organization can exploit social capital advantages to extract critical information at both the interview and job offer stages. These referred individuals (compared to those who are not referred by current organizational members) tend to present more appropriate résumés and to apply when market conditions are more favorable (Fernandez & Weinberg, 1997). Referred individuals have a significantly greater likelihood of being offered a job as a result of these advantages. Further, referrals (relative to non-referrals) can use inside knowledge to boost their starting salaries in the negotiation process.

Thus, what might appear to a corporate leader as a systematic process of institutionalized racism involving higher starting salary increases to ethnic majorities relative to ethnic minorities can be revealed through social network analysis as a function of who has friends inside the organization (Seidel, Polzer, & Stewart, 2000). The fairness of a hiring process may be fundamentally compromised because it is invisibly embedded in kinship and friendship networks.

The perception of this otherwise invisible process of homophilous hiring is crucial to any effort by the leadership team to increase workforce diversity. The explicit management of external ties to recruit new members who are known to existing members of the organization can enhance the organization's economic returns (Fernandez, Castilla, & Moore, 2000). If leaders comprehend the social network relationships not just among organizational employees, but also between employees and those outside the organization, then leaders can build the social capital of the organization by putting individuals' personal social networks to work for the organization's benefit.

Typically, managers are busy people whose work is fragmented and interrupted (Mintzberg, 1980). Much of our research in organization theory focuses on the formal arrangement of titles, offices, and reporting relationships, whether with respect to the integration and differentiation of the organization (e.g., Lawrence & Lorsch, 1967), the inertia of the organization (e.g., Hannan & Freeman, 1984) or the ceremonial façade created to be isomorphic with institutional demands (Meyer & Rowan, 1977). Leadership research, to the extent that it has considered social network relations, has also focused overwhelmingly (from an LMX perspective) on managers and the extent to which subordinates, for example, established networks that mirror those of their formally appointed managerial leaders (Sparrowe & Liden, *in press*).

The cognitive revolution in leadership research has focused not on the cognitions of leaders, but on leadership factors in the minds of followers (Eden & Leviatan, 1975; Lord & Emrich, 2001). There is an opportunity to extend both LMX research and cognitive approaches to leadership from the perspective of cognitive network theory (see Kilduff & Tsai, 2003: 70–79, for a review) with a focus on how leaders and followers comprehend: (a) the structure of social relations (cf. Krackhardt, 1990); (b) the embeddedness of economic action in affect-laden networks (cf., Uzzi, 1996); and (c) the opportunities for social entrepreneurship across structural divides (Burt, 2005). A greater understanding of how leaders and followers comprehend the social structure from which action in organizations proceeds can enhance research on the management of relationships by formal and informal leaders.

### 3.1. Accuracy

From a cognitive network theory perspective, leadership involves not just social intelligence (i.e., the accurate perception of social relationships in organizations) but also the management of others' perceptions. First, let us consider accuracy. People perceive the same network differently, with some individuals achieving a high degree of accurate perception, whereas other individuals lead their organizational lives in relative ignorance of the actual network of relationships within which work is accomplished (Kilduff & Krackhardt, 1994).

In general, perceptions of networks involving sentiment relations such as friendship suffer from a series of predictable biases. People prefer to see their own relationships as reciprocated—they prefer not to perceive their friendship overtures as unrequited. Similarly, people prefer to believe that their friendship circles are transitively complete—they like to believe that their own friends are friends with each other (Heider, 1958). This cognitive balance schema operates also as a default mechanism for filling in the blanks concerning ties between relative strangers at the individual's perceived organizational network's periphery. In the absence of contrary information, people tend to assume that friendship ties of others are reciprocated, and that two friends of a distant stranger are themselves friends (Freeman, 1992; Krackhardt & Kilduff, 1999).

These cognitive distortions can affect leadership emergence. People in organizations see themselves as more popular than they actually are (Kumbasar, Romney, & Batchelder, 1994), a tendency that can, perhaps, lead some individuals to neglect the vital process of maintaining their social capital (on the assumption that they are already popular); whereas other individuals, through a self-fulfilling prophecy process, may transform the illusion of popularity into actual friendship links that initially did not exist. Assuming that others like them, some people may reciprocate nonexistent liking, and thereby create friends. Slight initial differences with respect to how people perceive their connections to others can potentially lead to cumulative advantages through this self-fulfilling prophecy process.

Further, there may be a tendency to perceive popular actors as even more popular than they really are (Kilduff, Crossland, Tsai, & Krackhardt, 2005). Human beings, in their perceptions of social networks, are “cognitive misers” (Krackhardt & Kilduff, 1999) who may tend to simplify networks by perceiving them as dominated by a few central actors even if the actual network has no dominant cluster. A misattribution of popularity to a few actors can result in these actors actually increasing their popularity. An emerging leader who is perceived to be popular may benefit from a bandwagon effect: people may want to associate with someone perceived to be a rising star. On the other hand, the perception that a social network is dominated by an elite group of leaders may discourage those who perceive themselves on the periphery from attempting to pursue leadership options.

### 3.2. Schemas

New research (Kilduff et al., 2005) suggests that individuals may tend to perceive friendship networks in organizations as small worlds. Small world network structures are unusual in that they exhibit both high local clustering

and short average path lengths—two characteristics that are usually divergent (Watts & Strogatz, 1998). Clustering refers to the extent that actors are connected within local groups, whereas path lengths refer to the number of network connections between one actor and another in the network. A small world network resembles the hub-and-spoke structure of the U. S. commercial air traffic system: local hubs with lots of connections; and short average path lengths because journeys from one city to another are routed through the hubs. (Compare this with the distinctly non-small world of the U.S. interstate highway system.)

The small world effect, investigated originally in the 1960s by Milgram (1967), has become a burgeoning area of organizational social network research (e.g., Kogut & Walker, 2001; Uzzi & Spiro, *in press*). As social networks become larger and more global, the discovery that some of the largest social networks such as the World Wide Web exhibit small world properties has excited considerable research interest (see Dorogovtsev & Mendes, 2003, for a review). Leadership within extremely large networks is a neglected topic, but one that seems tractable from a small world perspective, given that small world networks are organized for efficient communication and coordination.

We focus here on the possibility that some individuals more than others misperceive the extent to which organizational networks resemble small worlds (Kilduff et al., 2005). Such a bias has distinct implications for leadership research. A small world network schema offers a considerable advantage to the aspiring informal leader in terms of reducing the cognitive load required to keep track of so many different relationships. The rules for creating a cognitive map of the friendship network are relatively simple from this perspective: put similar people (with similarity defined on some relevant dimension such as demography or interests) into clusters and connect the clusters. Further research is needed to examine the extent to which the match between the “small worldedness” of the individual’s cognitive network and the small worldedness of the actual network predicts leader effectiveness.

Cognitive network schemas play a significant role in one important aspect of leadership, namely coalition building (cf., Stevenson, Pearce & Porter, 1985). Leaders are constantly involved in appointing people to task forces and committees. Making sure that the right balance of people is involved in these teams can make the difference between gridlock and effective action. In a pioneering set of studies, researchers found that individuals with experience of networks characterized by disconnections—structural holes—were better at perceiving the potential to bridge across structural holes by identifying suitable collaborators—a key to successful coalition (Janicik & Larrick, 2005). By making sure that different constituencies are represented at the top of the organization, the leader may facilitate the engagement of widely different groups in the organizational mission. But in order to make these representative appointments, the leader must first be able to accurately perceive existing social system cleavages.

This recent research on the structural hole schema is interesting in suggesting that people are able to move beyond reliance on default modes of thinking (such as balance) when trying to make sense of the social network in organizations. People learn from experience to expect certain patterns in the social world, and tend to see new situations in the light of their anticipations. Thus, the leaders of an organization, familiar with the patterns of activity taking place from day to day, may impose on these patterns of interaction their own preconceptions of who shows up for meetings. Leaders anticipate that regular attendees will show up, and remember these people as having showed up even if they did not, while forgetting that more peripheral members of the organization were actually present on a specific occasion (cf. Freeman, Romney, & Freeman, 1987). Further, people in general tend to perceive themselves to be more central in friendship networks in organizations than they actually are (Kumbasar et al., 1994). Thus, network cognition can depart from actual patterns of network activity, with consequences for the leader’s ability to uncover political conflicts, spot communication problems between culturally divided groups, avoid reliance on problematic individuals for the transmission of important resources, achieve strategic objectives through the appointment of key people to influential positions, and manage relations within and across departments (Krackhardt & Hanson, 1993).

Leaders who perceive important social networks accurately in their organizations are likely themselves to be perceived as powerful (Krackhardt, 1990). This perceived power can itself represent an important supplement to formal authority. Still to be investigated more thoroughly is the question of whether and how leader acuity in the perception of social networks affects team performance (cf. Greer, Galanter, & Nordlie, 1954).

Leaders with accurate social perceptions may be able to manage the perceptions of others. Consider this quote concerning the perception of social capital:

At the height of his wealth and success, the financier Baron de Rothschild was petitioned for a loan by an acquaintance. Reputedly, the great man replied, “I won’t give you one myself; but I will walk arm-in-arm with you across the floor of the Stock Exchange, and you soon shall have willing lenders to spare” (Cialdini, 1989, p. 45).

This kind of purposeful action can influence others' perceptions of social structure. As one research report noted concerning this example, "Baron de Rothschild signaled to the members of the London stock exchange his close link to a would-be borrower, and observers of this public demonstration of friendship no doubt upgraded their evaluation of the creditworthiness of the baron's apparent friend" (Kilduff & Krackhardt, 1994, p. 87). Similarly, for those who want to span across structural holes and gain the reputed benefits of this activity, it may be crucially important to be perceived by others as *not* pursuing personal agendas (Fernandez & Gould, 1994). The management of social perceptions takes place within organizations that can be understood as reputational markets (Kilduff & Krackhardt, 1994). In the battle to achieve prominence, individuals may strive to appear to others to be associated with leaders of high status. The perceived status of exchange partners can act like a distorting prism to filter attributions concerning the focal individual (Podolny, 2001).

Individuals move in and out of organizational contexts, and as they do so, their structural positions change. In one context someone assumes a leadership position, but the same individual may be a follower in another context in the same organization. Partly this is based on shifting perceptions. Individuals self-perceive themselves as powerful in some contexts and as less powerful in other contexts, and their self-attributions may be concordant with or discrepant with others' attributions. Actors in organizations may exert power without having to request compliance with their demands, simply on the basis of possibly false perceptions: "Just as players can successfully 'bluff' in poker, employees can also act as if they control scarce resources, as if they were potentially powerful... Persons who are in a position to control information can withhold, disclose, and modify it in order to influence others' attributions of power" (Brass, 1992: 299).

Thus, the importance of perceptions of leadership emergence and individual influence may reside in the extent to which they are never tested. In one recorded instance of a battle between dual CEOs for the exclusive control of the Lehman Brothers investment banking house, Louis Glucksman convinced his rival Pete Petersen that Petersen had lost friendships with board members, whereas Glucksman had retained their regard. But neither rival checked to see if their perceptions of their social relations with the all-important board members were accurate (Auletta, 1986).

To summarize our general ideas concerning the importance of acuity in leaders' perceptions of social networks, we indicate in Fig. 1 that accuracy is likely to improve the extent to which a leader occupies a strategic position in three social network structures relevant to organizational behavior: the ego network, comprising the individuals immediately connected to the leader; the complete organizational network, comprising not just direct connections but also the leaders' indirect connections to everyone in the organization; and the interorganizational network of relationships important to the leader's work outside the focal organization.

In Fig. 1 we also include the role of cognitive schemas—such as the small world schema we discussed above – in determining the match between leaders' perceptions of networks and actual networks. We need more research concerning the extent to which such cognitive schemas help or hurt leaders develop accurate maps of the social networks within which they operate. Whereas research on cognitive shortcuts implies that perceivers who rely on such shortcuts tend to make errors (Kahneman & Tversky, 1973), others see positive benefits deriving from the use of such schemas (e.g., Taylor & Brown, 1988) including greater satisfaction in close relationships (Murray, Holmes, & Griffin, 1996; see Kenny, Bond, Mohr, & Horn, 1996, for evidence concerning the effects of relational schemas on accuracy).

### 3.3. Cognitive network methods

To pursue research of this kind requires special methods. First, it is necessary to collect cognitive social structure data (Krackhardt, 1987) comprising, for each person in the sample, a complete cognitive map of the network relationships. Thus, if we are interested in friendship relationships among 33 people, we would ask each of the 33 people to tell us who their friends are. Further, we then ask each respondent to identify the friends of the remaining 32 individuals in the network. This would provide us with 33 different cognitive maps, each one representing an individual's picture of the friendship relations in the 33-member organization. These maps are likely to be quite different from each other (see the illustration in Kilduff & Krackhardt, 1994).

To assess the accuracy with which each person views the social network requires constructing an actual map of the friendship relationships. This is the second step. There are different decision rules possible for deciding whether a perceived friendship link is an actual friendship link. The rule most commonly used has good face validity: a friendship link really exists if both parties to the link perceived that it exists. Thus, if both Charles and Amdahl perceive that Charles regards Amdahl as a friend, we would say that a one-way friendship link from Charles to Amdahl really exists.

Alternatively, if the majority of people say that a friendship link existed then it could be judged to really exist. These different possibilities are available within the UCINET software suite of programs (Borgatti et al., 2002).

Once we have constructed the actual network, the third step is to correlate each perceived network with the actual network. Social network data are systematically autocorrelated within rows and columns, and so the significance of such correlations between perceived and actual network maps has to be assessed by nonparametric means. The autocorrelation problem arises when data are collected from, for example, 33 people to produce data matrices containing nonindependent observations on all the possible pairs of people represented in the 33-member sample (Krackhardt, 1987). The significance of a Pearson correlation between a perceived and the actual network is assessed through the nonparametric Quadratic Assignment Procedure (Krackhardt, 1988) that repeatedly randomly permutes the rows and columns of one of the network matrices, recalculating the correlation each time, to produce a distribution of correlations against which the observed correlation can be compared (see Kilduff & Krackhardt, 1994, for an example; and Kilduff & Tsai, 2003: 139–140; 149–150, for more details including an empirical example).

We have spent considerable time on the social cognition of networks of relationships given the growing recognition within leadership research of how leader cognitions affect leader behaviors with implications for both leader effectiveness and organizational effectiveness (e.g., Hooijberg et al., 1997). Leadership research has long recognized the importance of implicit leadership schemas in the minds of followers (see Lord & Emrich, 2001, for review). Building on this emphasis on cognition and cognitive schemas, we seek to extend leadership research from a distinctively network emphasis on social relations, embeddedness, social capital, and social structure.

#### 4. The ego network

Moving on from the network cognitions in the head of the individual, we now consider the social circle of relations actually surrounding the individual. A strong argument could be made that it is this ego network that fundamentally affects all the other network relationships a leader forms and influences—hence the centrality of the ego network in Fig. 1. It is this personal network that forms the basis of, for example, the influential structural hole perspective (Burt, 1992, 2005). A major task of future research is to assess whether the structure of direct connections leaders have with colleagues is as important as the structural hole approach implies, or whether more indirect connections involving intermediaries can dampen or enhance leadership effectiveness, as implied in embeddedness research (Uzzi, 1996).

##### 4.1. Density

A key theoretical concept concerning how direct connections within the ego network relate to leadership is density, as indicated in Fig. 1. Individuals whose social contacts are themselves connected to each other have dense social circles, whereas individuals whose social contacts have few connections amongst themselves have sparse social circles (Wasserman & Faust, 1994). Members of a dense network tend to share similar attitudes and values towards the leader of the organization (Krackhardt, 1999).

From a network perspective, whether the members of a dense network tend to enhance or neutralize the leader's effectiveness is likely to depend upon whether the shared attitudes toward the leader are positive or negative. A dense network of people favorably disposed toward the leader represents a pool of social capital available to the leader. Messages communicated to this group are likely to be favorably received, and expeditiously transmitted. A dense network of people negatively inclined toward the leader represents a potentially distorting prism, likely to take any message or initiative from the leader and cast it in the most unflattering light. More research is needed on the ways in which dense networks distort or enhance leadership initiatives.

##### 4.2. Range

Structural-hole theory (Burt, 1992), following on from the weak-tie hypothesis (Granovetter, 1973), suggests that individuals whose personal contacts include a diverse range of disconnected others gain benefits. These benefits (including faster promotions—Burt, 1992) derive from the information and control possibilities of being the “third in the middle” between other individuals who must pass resources and information through the focal individual. Thus, the focal individual has access to diverse communications within his or her immediate contacts. If the individual

(conventionally referred to as “ego” in network research) is embedded in a clique, then the diversity of information and resources reaching ego from immediate contacts may be low. Further, the opportunity for ego to play an informal leadership role, distributing ideas and other valued resources throughout the immediate social circle, vanishes if ego is simply one more person in a highly connected group.

As simple as the implied principle appears to be—connect oneself to diverse others who themselves are not connected to each other in order to enhance leadership potential in the informal network of relationships—it is much harder to realize than might at first be apparent. The principle of embeddedness operates strongly in this context. Simply stated, individuals prefer to associate with homophilous others—those who are similar to themselves (McPherson, Smith-Lovin, & Cook, 2001). This tendency is likely to be just as strong among putative leaders as it is among people in general—even economic transactions at the firm level tend to be embedded in kinship and friendship networks (Uzzi, 1996).

Homophilous networks represent information restriction (Popielarz, 1999). Individuals embedded in such networks, established not just in terms of kinship, but also on the basis of proximity (Festinger, Schachter, & Back, 1950) ethnicity or gender (Mehra, Kilduff, & Brass, 2001), are likely to experience strong cohesion (lots of ties among the similar others) but also information restriction. Groups as powerful as the dominant coalition (Cyert & March, 1963), the top management team (Hambrick & Mason, 1984) and the board of directors (Palmer, 1983) may exhibit in-group homogeneity under the pressures of ease of communication, shared backgrounds, and demographic similarity (see the review in Westphal & Milton, 2000). Social capital advantages are likely to be significantly diminished as leaders embed themselves in homogenous groups, leading to negative effects on market share and profits (Hambrick, Cho, & Chen, 1996). Business survival prospects tend to be better for those businesses whose owners establish a large range of personal contacts with important representatives of the task environment relative to those owners who establish a smaller range of such contacts (Oh, Kilduff, & Brass, 2005).

#### 4.3. Cohesion

The cohesiveness of a dominant coalition may be sharply increased if the coalition perceives it is challenged by a set of actors (pursuing a hostile takeover, for example) or by negative outcomes of previous decisions (Kilduff, Angelmar, & Mehra, 2000). This increased homophily, while facilitating coordinated action by the top management team may adversely restrict decision-making options. The extent to which leaders turn to their personal contacts for advice following poor firm performance predicts subsequent tendencies to minimize changes in corporate strategy (McDonald & Westphal, 2003).

There are strong pressures in organizations for people to agree with their personal friends concerning important values and ideas. For an informal leader, embedded in a coalition of like-minded individuals, to challenge the hegemony of the official culture is always possible. But it is much more difficult for an informal leader to resist the social pressure from within his or her social circle to agree with close friends concerning how to interpret widely shared core values (Krackhardt & Kilduff, 1990).

It is interesting to note that, from a network perspective, the social pressure on ego differs little irrespective of the size of the clique within which ego is embedded, given that the clique contains people who all have ties to each other within the clique, but no common ties to those outside. Whether ego is embedded in a three-person clique or a clique of larger size, ego still experiences group pressure to conform (Simmel, 1950). This pressure becomes powerful as soon as a dyadic interaction (between two people) expands to include three people. To the extent that a leader belongs to two or more of these cliques (of size three or larger), the leader is vulnerable to cross-pressures from the different cliques to which he or she belongs. Different cliques tend to reinforce different interpretations of reality, and these discrepant interpretations may place the leader, who links the two different cliques together and who may play a brokerage role between these different groups, in a complicated situation. Each clique may present the leader with demands that, considered jointly, may be difficult to meet.

One case study described how an informal leader, who strongly favored the ongoing unionization drive in an entrepreneurial company, found himself unable to use his influential position in his personal social circle to influence others. This individual was a member of eight different three-person friendship cliques and was thus “frozen by the set of constraints imposed by the numerous cliques” (Krackhardt, 1999:206). Three of this person’s cliques contained vociferous opponents of unionization. So unpleasant was his position in his social circle that he resigned from the firm 10 days before the unionization vote was taken, and rejoined the firm two days after the vote had failed. This

individual's apparent power in the social circle of personal friends was stultified by his embeddedness in cohesive, but mutually discrepant, cliques.

#### 4.4. *Informal leadership emergence*

Within the social circle surrounding the formal leader, there are likely to be some individuals who play informal leadership roles. These informal leaders tend to spring up in teams in which formally appointed leaders play little or no role in the coordination of team activity (perhaps because the formal leaders are focused on activities external to the team). Thus, informal leadership is likely to be a feature of teams in which formal leadership is, relatively speaking, absent. One study of leaderless teams found that informal leaders disproportionately influenced team efficacy—the extent to which team members evaluated their abilities to perform specific work-related tasks (Pescosolido, 2001). Such informal leaders also play a role in regulating team members' emotions (Pescosolido, 2002). Key process variables, such as team efficacy and team emotions, affect team performance (Barsade, 2002; Gibson & Vermeulen, 2003).

Given the potential power of these informal leaders to manage the cognitions and emotions of group members, even in the absence of any formal authority, formally appointed leaders' relationships with these informal leaders becomes more important than perhaps approaches that have focused on leader–member exchange relations have recognized. We suggest that within the leader's in-group there are some ties that are more crucial for leader effectiveness than others; and, outside the leader's in-group, neglect of individuals with considerable social influence is likely to imperil leader effectiveness.

#### 4.5. *Ego network methods*

The analysis of the structure of these direct ties surrounding individual leaders is enhanced by the ongoing availability of randomly collected ego network data on managers and non-managers in the General Social Survey. Interviewers asked respondents: "Looking back over the last six months, who are the people with whom you discussed matters important to you?" The interviewers were instructed as follows: "Please allow respondent to pause, collect thoughts and report. Probe after first reports. We want people with whom respondent discusses important personal matters. Do not try to define or give examples". Interviewees were asked to describe the relationships among the first five people on their lists in terms of whether they were strangers, especially close, or neither strangers nor especially close. (See Carroll & Teo, 1996, for more details and an example of an analysis comparing the ego networks of managers and non-managers). These ego network data can be used to identify the number of direct ties reported by the respondent; to identify the presence or absence of structural holes (e.g., Cummings & Cross, 2003); and to see how dense the ego network is.

An advantage of the ego network approach is the ability to randomly sample social networks within a very large social system, such as the major corporation surveyed by Burt (1992). Thus, this approach permits social network research to encompass major organizations rather than to confine itself to the relatively small organizations characteristic of, for example, cognitive social network research described previously. A disadvantage of the ego network approach is the possibility of mono-source bias given that only one respondent provides information concerning all the connections within a particular ego network. Respondents are relatively inaccurate in perceiving connections among their immediate contacts (as Krackhardt, 1996, has demonstrated). At the same time, a friendship relationship between two individuals in a small company tends to be generally recognized by others in the company (Kenny et al., 1996). The issue of cognitive accuracy with respect to ego network research is likely to be an important one as the structural hole approach continues to gather strength.

To summarize this section is to recognize that structural hole theory (Burt, 1992) suggests that would-be leaders should structure their interpersonal networks to reach diverse constituencies, using relatively few ties to expand the range of information and resources accessed. An effective network strategy, according to this interpretation of structural hole theory, is likely to involve leaders building links to a variety of different constituencies and delegating to trusted "lieutenants" the task of managing relationships with the other members of each constituency. Information would flow to leaders through the trusted lieutenants from all around the organization. It is with each trusted lieutenant that the informal leader develops and maintains a strong tie (as suggested in the dyadic approach to leadership—see Dansereau, 1995, for a review). It is this emphasis on extending the leader's ties throughout the organization that we turn to next.

## 5. The organizational network

There are some caveats to the “divide and conquer” strategy advocated from the influential structural hole perspective (Burt, 1992, 2005). From this perspective, would-be leaders are recommended to divide social networks in organizations into non-overlapping groups and to harvest social capital benefits from brokering information and other resources between these groups. However, as structural hole theory recognizes, there are some groups (such as boards of directors) whose importance may require a much more intensive relational strategy. To the extent that all the members of a particular group have power over ego’s leadership effectiveness, then it makes sense for ego to invest in a personal relationship with every member of the group. Second, the effectiveness of informal leadership is likely to depend not just on direct links to others, but also on the pattern of links beyond the immediate ties. The important idea here, then, is that the structural position of ego in the social network affects the leadership potential of the individual in the organization, and this principle extends beyond the immediate social circle of the individual.

From an embeddedness perspective (Uzzi, 1996, 1997) an effective leadership network is a multi-step process, only one step of which is under the control of ego. First, ego needs to build ties to individuals who represent access to and from key constituencies within and outside the organization. But, second, ego needs to monitor whether representatives of these key constituencies themselves have access to networks. And third, ego must monitor the inter-relationships between these representatives (cf. Sherry & Green, 2002; Sparrowe & Liden, *in press*). Leadership success can crucially depend upon these secondary networks, and the interrelationships between people beyond the leader’s ego network.

At present, we know little about how a leader within an organization functions in the context of the social networks of “informal” leaders who may or may not be occupying positions of official authority. Informal leaders, typically of lower rank than the primary leaders (to whom they may or may not report directly), wield considerable influence derived from their positions in the social network (Mechanic, 1962). We can glean some insight into how a leader at one level can benefit or suffer from the activities of socially well-connected informal leaders by considering the literature on substitutes for leadership. Leaders whose subordinates possess expert power, for example, may find themselves to be relatively redundant. Subordinate expertise can act as a substitute for leadership in some cases and in other cases subordinates, representing the leader, can deputize for the leader (Gronn, 1999; Kerr & Jermier, 1978; Podsakoff & MacKenzie, 1997). This form of distributed leadership (Mayo, Meindl, & Pastor, 2003) is one of the least understood aspects of leadership and needs to be further explored.

### 5.1. Mentoring distributed leadership

From the network perspective articulated in this article, leader effectiveness involves building social capital that benefits individuals in the organization and extending the social networks of subordinates to facilitate career advancement. One measure of leader effectiveness, therefore, is the success of the leader in promoting the social networks and leadership potential of subordinates. By systematically sponsoring subordinates’ development of social capital through introductions to key people in the organization and the environment, leaders can enhance the overall leadership potential in the organization and groom their subordinates for organizational success. Hence the emphasis on the mentoring of distributed leadership as an aspect of leader effectiveness in Fig. 1. The perceived influence of protégés in the organization is likely to be related to the extent to which the protégés build links across demographic boundaries. Thus, helping a man build links to the network of women or a woman build links to the network of men within an organization can enhance the protégé’s leadership potential measured in terms of perceived power (Brass, 1985).

Such sponsorship is likely to be especially important in the case of members of underrepresented groups whose own attempts at brokerage across social divides may rebound to hurt rather than help their careers according to research in one firm (Burt, 1992). Members of underrepresented groups tend to form homophilous networks among themselves and may also experience discrimination from majority group members (Mehra, Kilduff, & Brass, 1998). The mentoring of underrepresented group subordinates involves facilitating the development of the subordinates’ own networks that may expand in directions not covered by the leader’s own connections (cf. Higgins & Kram, 2001). Research suggests that such mentoring relationships can be successful even when the sponsor and the protégé are from different ethnic groups (Thomas, 1993). Network leadership, then, can be measured in terms of how much social capital it creates for

others, especially those members of underrepresented groups whose social network ties may be restricted because of in-group pressures toward homophily and out-group bias (Mehra et al., 1998).

A particularly important test of network leadership occurs in the case of isolates. G. K. Chesterton wrote, “There are no words to express the abyss between isolation and having one ally.” Members of work teams who consistently fail to communicate with their colleagues may represent wasted resources in today’s coordinated organizations whether or not they suffer the “abyss” of isolation. Research in three high-technology military organizations showed that isolates, relative to “participants”, tended: to rely more on written and telephone communication, to withhold information, to express less commitment to the organization, to experience lower satisfaction with both communication and with their jobs, and to be rated as lower performers (Roberts & O’Reilly, 1979). Clearly, such isolated individuals represent a networking challenge. The extent to which such isolates are part of work groups may predict the extent of leader effectiveness in such groups. A related issue concerns the extent to which work groups exhibit disconnects between subgroups. Although recent work suggests that too few or too many structural holes in a team may adversely affect communication (Oh, Chung, & Labianca, 2004) and team effectiveness, the question of how such structural holes affect team performance and functioning remains unanswered (Balkundi, Kilduff, Michael, Barsness, & Lawsen, 2005).

### 5.2. *Positive emotion*

Isolates and structural holes in groups tend to signal the existence of emotional distress. Research attention has started to focus on the role of formal leaders in the emotion management network in organizations (Toegel, Anand, & Kilduff, 2004). Vertical dyad linkage theory alerted researchers to the benefits—emotional and vocational—associated with membership in the leader’s in-group (see Dansereau, 1995, for a review). Building on this legacy, the positive psychology movement suggests that leaders have responsibility for maintaining the emotional health of all employees (Frost, 2003) rather than just those with privileged access to the leader. Yet, some people in formal leadership roles fail to attend to the toxic emotions created in organizational contexts and thereby fail to perform as effective leaders (Maitlis & Ozcelik, 2004). The question of the management of affective bonds and emotional health has been neglected in the leadership and in the network literatures and begs for more attention.

### 5.3. *Organizational network methods*

To address questions concerning the structural position of the leader within the organization, it is necessary to collect or access whole-network data. One popular method—the roster method—involves providing each respondent with a complete list of the members of the organization from which the respondent identifies his or her friends, advice partners, etc. (e.g., Pastor et al., 2002). These choices can be verified by checking the data provided by the others in the organization. The whole-network approach provides reliable data (Friedkin, 1981) and avoids mono-source bias. Further, these data can generate measures at the individual level of analysis (e.g., the centrality of each individual) or at the network level of analysis (e.g., the extent to which the network is centralized around a few actors). These measures can then be used in standard statistical procedures including linear regression (e.g. Ibarra, 1992) and structural equation modeling (Tsai & Ghoshal, 1998).

### 5.4. *Centrality measures*

The fate of our most cherished projects may depend on an informal leader’s structural position in the social network. In network research, informal leadership is often equated with centrality: more central individuals tend to be perceived as powerful (Brass, 1992) and to move into leadership roles (Bass, 1990). But centrality itself comes in many different forms—an insight that goes back at least as far as Moreno’s (1953) pioneering sociometric studies. Perhaps the most familiar type of centrality is popularity (referred to in network research as degree centrality). Throughout the 1950s, studies investigated whether formal leaders who were also occupants of informal structural positions in terms of being popular within their teams were more effective than those formal leaders who were less popular (e.g., Fiedler, 1955; Jenkins, 1959). A recent meta-analysis of 11 such team-leader popularity studies found that team-leader popularity had a positive effect on team performance (Balkundi & Harrison, in press).

Still unanswered is the question of the effects of leaders’ tendency to reciprocate relationships such as friendship on leadership effectiveness. A case can be made that individuals who receive many more friendship signals or requests for

advice than they reciprocate can be said to have high prestige, a measure of perceived leadership potential (Brass, 1992). Modern network theory tends to emphasize the leader's strategic use of network ties to manage environmental contingencies both within and outside the organization (Baker, 1990; Pfeffer & Salancik, 1978) rather than on the leader as a schmoozer. Indeed, in one study of work performance, the popularity of the individual (number of friends, number of work partners) predicted low performance once another type of centrality—betweenness centrality—was controlled for (Mehra et al., 2001). But, network stars, who fail to reciprocate many of the relationships in which they are involved, may suffer their own form of isolation at the top (Chapin, 1950).

Betweenness centrality has emerged as a strong predictor of leadership perceptions (Mullen & Salas, 1991) and emergence (e.g., Brass, 1984). The betweenness centrality of an actor is the extent to which the actor serves as a potential “go-between” for other pairs of actors in the network by occupying an intermediary position on the shortest paths connecting other actors (Kilduff & Tsai, 2003: 132). A meta-analysis of experimental communication networks found that individuals with high-betweenness centrality tend to be seen as leaders by others in the network (Mullen & Salas, 1991). The “go-between” leader is a broker who helps bridge across differentiated clusters, and, thereby, helps coordinate activities and information flow in the organization (cf. Lawrence & Lorsch, 1967).

One experimental study, comparing several types of centrality positions on perceptions of leadership, concluded that, “betweenness, then, seems to be the key to understanding choice as leader” (Freeman, Roeder, & Mulholland, 1979: 129). The high-betweenness individual can play an important coordinating role within organizations by bridging between disconnected clusters and also by providing a link by which an actor in one distant part of the organization can send or receive information from another distant part of the organization. Hence, we include brokering as an outcome associated with leadership effectiveness in Fig. 1.

Another type of leadership within the organization involves economizing on scarce energy and time by connecting to prominent people, and, thereby, gaining access to social capital through intermediaries (Bonacich, 1987; Bonacich & Lloyd, 2001). This type of “borrowed” centrality (referred to as eigenvector centrality in the network literature) allows ego to avoid the perils of popularity (too many ties to maintain) and the potential hazards of the go-between position (conflicting demands from disconnected actors). A few connections can provide access to valuable resources if they are to prominent actors. These enhanced resources may show up in terms of improved team effectiveness. For example, in one study, team leader friendship with other prominent leaders tended to positively affect the level of sales and customer loyalty (Mehra, Dixon, Robertson, & Brass, 2004). The downside of connections to prominent others may be that reflected glory comes with a price: the “borrowing” leader may incur obligations that necessitate reciprocal repayment. The advantages and disadvantages of these three leadership strategies—popularity, betweenness, and borrowed glory – deserve further research into their effects across a range of situations.

## 6. The interorganizational network: Boundary spanning and alliances

Leaders, both formal and informal, can potentially network within their organizational units and outside their units. As representatives of their organizational units, leaders forge interorganizational links that may or may not lead to or coincide with formally contracted relationships. Beneath most formal alliance ties between organizations “lies a sea of informal ties” (Powell et al., 1996: 120). Interpersonal friendships and other strong links such as kinship between CEOs can lead to business alliances, just as business alliances can lead to warmth and trust between representatives of different organizations (Larson, 1992; Uzzi, 1997).

One dramatic case study, referred to earlier in this article, highlighted the danger of two individuals dividing the networking task between them into its internal and external components (Auletta, 1986). Lehman Brothers was a venerable Wall Street investment banking firm in which partner Louis Glucksman operated as the inside networker, maintaining cohesion and rapport with the company's traders, whereas partner Pete Petersen operated as the outside networker, responsible for bringing in new business from the rich and famous. When both partners were anointed as joint CEOs, the ensuing battle for supremacy led to a financial crisis and a takeover by American Express, bringing to an inglorious end one chapter in the saga of a proud and independent institution. In the furious battle for control between the inside and outside networkers, Glucksman had the upper hand, having developed social capital within the organization among the partners who controlled the firm through their votes.

As this example illustrates, managing the boundary between inside and outside networking is a crucial task for formal leaders. The formal leader can be considered a boundary-spanner who manages not only an internal

constituency within the organization but who also represents the organization in the community of organizations. Network links between organizations tend to build from within the existing network. Organizational leaders create stable relationships with trusted partners, and, over time, these stable ties accumulate into a network that provides to members of the network information about future alliance partners (Gulati & Gargiulo, 1999). Organizational leaders, for example, tend to recommend to one trusted partner the formation of a business relationship with another trusted partner, thus creating a three-member clique (Larson, 1992; Uzzi, 1996). With knowledge increasingly emerging from the interstices between hierarchical boundaries (Powell et al., 1996), leaders who pursue policies of splendid isolation are likely to see their organizations suffer “the liability of unconnectedness” (Baum & Oliver, 1992) in failing to capture intellectual developments as they arise and expand.

An innovative organization such as Digital Equipment Company, once famed for its fortress-like culture and its devotion to in-house technical development (Kunda, 1993), is likely to fade away in a knowledge economy in which innovations are increasingly the product of industrial clusters rather than individual companies (Saxenian, 1990). Given the inertia of organizations relative to the speed of change in many environments (Hannan & Freeman, 1984), even large and apparently dominant organizations in knowledge intensive industries need to build connections with a range of other organizations in order to access developing technology.

However, leadership effectiveness in this knowledge economy may depend not just on the direct network links to other organizations under the leader’s control, but also on the links beyond the leader’s control. As we noted with respect to networking within the organization, it is often the links beyond the immediate social circle of the leader that affect many desired outcomes. Research suggests that the survival of the organization itself may be affected by the secondary links to organizations beyond the leader’s immediate control.

For example, in the New York garment industry, CEOs who developed strong personal relationships with the heads of “jobbing” firms (that distribute work orders) increased the survival chances of their firms if they were able to access through these strong connections networks of balanced relationships. It was not just the primary ties to the jobbing firms that were important for the focal firms. Survival was enhanced for the firms of those CEOs strongly connected through a primary tie to a set of secondary ties that include a balanced mix of arm’s length and close ties with a jobbing firm (Uzzi, 1997). Although the CEO may have some control over whether to develop close, personal ties or more market-based exchanges with heads of jobbing firms, the CEO may not even be aware of the types of business relationships that jobbers have with other firms. Thus, leadership effectiveness (and the survival of the organization) may depend on second-order network links beyond the control of the CEO.

What of the leader’s centrality in the community of organizational leaders? Research shows that organizational leaders tend to interact with each other across a range of social events, with representatives of elite organizations tending to form their own elite social circles (Galaskiewicz, 1985; Kilduff & Tsai, 2003: 22). However, centrality in this community of leaders may distract leaders from the strategic management of their own organizations. One study of an ethnic community of Korean expatriate entrepreneurs showed that the extent to which organizational owners were central (in terms of spanning across divided social groups within the community) correlated negatively with performance and predicted organizational demise (Oh et al., 2005). Of compelling interest, however, is the extent to which the leader’s ties to organizational leaders outside the immediate community affect the flow of important resources and, thereby, organizational survival.

It may be in the interorganizational arena that new network methods focused on social network dynamics emerge, given the strong interest in understanding the evolution of strategic alliances (e.g., Gulati & Gargiulo, 1999). Conventional wisdom suggests that networks tend to be relatively stable, but this apparent stability can mask many types of change that can be captured in network “movies” showing the dance of interactions over time (Moody, McFarland, & Bender-deMoll, 2005).

## 7. Conclusion

Leadership requires the management of social relationships. Starting with the cognitions in the mind of the leader concerning the patterns of relationships in the ego network, the organizational network, and the interorganizational network, social ties are formed and maintained, initiatives are launched or avoided, and through these actions and interactions, the work of the leader is accomplished. Building on the idea that networks are both cognitive structures in the minds of individuals and actual structures of relationships that link individuals, this article views organizational networks as constructed and maintained by boundedly rational actors, subject to biases in their perceptions. Leadership

research from a network perspective has the opportunity to forge a new understanding of the interplay between the psychology of individuals and the complexity of the networks through which actors exchange information, affect, and other resources.

Leadership research also has the opportunity to renew our understanding of how patterns of informal leadership complement or detract from the work of formally appointed leaders. If leaders rely solely on their formally assigned authority, and bring into their leadership circles like-minded others, they may isolate themselves from new ideas (as represented by, for example, the slow learners investigated by March, 1991). Further, the influence of visible leaders, both informal and formal, is likely to be affected by network ties that may not show up at all in the organizational chart. The members of governing coalitions, for example, are likely to be tied to powerful individuals temporarily removed from positions of authority and deal makers who operate quietly to influence organizational outcomes. Only recently has research attention focused on these virtual actors whose “ghost” ties constrain network change and action (see, for example, Moody et al., 2005).

Future research is likely to focus on how small changes in network connections (by, for example, one individual) can transform the flow of leadership throughout the whole organization, where leadership flow is understood to include influence patterns, reputation, and status. Because of the interconnected nature of leadership influence, a connection between disparate actors within the organization can result in resources moving through new conduits, bypassing formal leaders and local clusters. Small investments by one actor in social connections can produce a large harvest of social capital and influence.

In bringing a network perspective to bear on leadership, we draw attention to the importance of social relations that have previously been highlighted in leadership research by the vertical dyad linkage model (Dansereau et al., 1975) and the leader–member exchange approach (e.g., Graen & Uhl-Bien, 1995). The network approach articulated in this article enriches our understanding beyond these previous approaches by emphasizing the extent to which individuals’ thoughts and actions are embedded in their perceptions of networks, in the immediate “ego” networks that surround them, in the organizational networks within which their ego networks are embedded, and in the interorganizational networks that connect them to leaders of other organizations. Leaders, we have emphasized, generate and use social capital through the acuity with which they perceive social structures and the actions they take to build connections with important constituencies within and across social divides.

To understand leadership effectiveness from a social network perspective is to study the individual’s position in the larger networks within which the individual is located. The network approach, therefore, allows a more macro focus on the full repertoire of network relationships than has been the case in previous leadership research. The analysis moves beyond the individual and beyond the dyad to incorporate the network as a flexible unit of analysis whose boundaries are determined by the researcher’s particular interests. The network approach also incorporates actors within the network who may or may not be connected with the leader, but whose actions, in creating new ties, for example, can affect leader outcomes by changing the structures within which the leader operates. The network approach brings its own distinctive set of mathematical tools and limitations. We have briefly surveyed methods for the analysis of cognitive networks, ego networks, and whole networks. We also discussed the different meanings of centrality and other network concepts. Clearly, the network perspective in its emphasis on social relations, embeddedness, social capital, and social structure, both incorporates strands emphasized within previous leadership research, and points in new directions.

In summary, the potential synergy between leadership research and social network approaches is huge. A focus on the social networks—both cognitive and actual—of organizational leaders is likely to enhance our understanding of organizational behavior, given the influence of leaders on the daily interactions of organizational members. The social network perspective has traditionally avoided a focus on specific individuals, preferring to examine systematic patterns of interaction. Bringing leadership research into the picture requires a new integration of network theory and methods to account for not just structural patterns, but also the focused activities of powerful individuals.

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