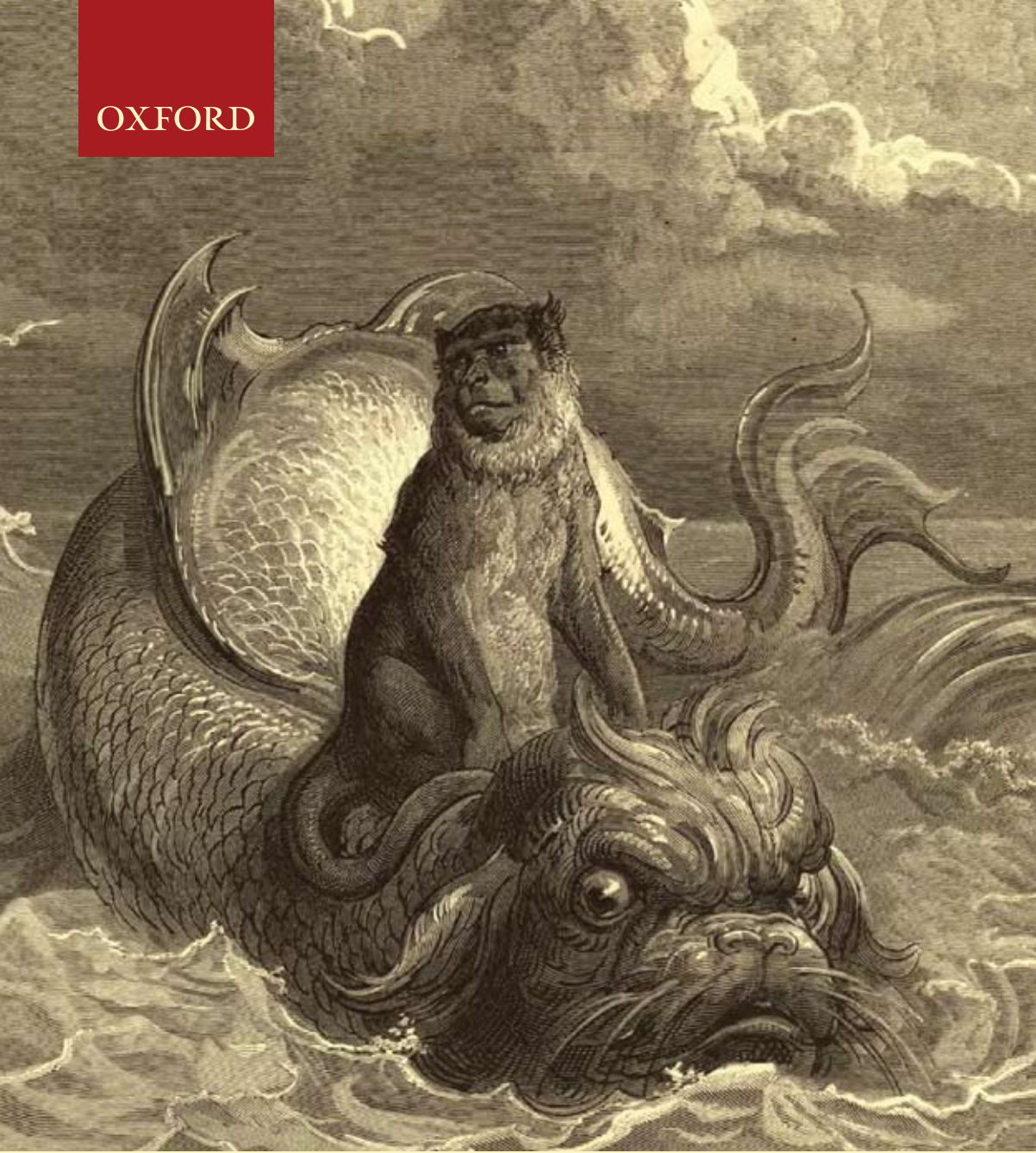


OXFORD



# Neighbor Networks

*Competitive Advantage Local and Personal*

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# **Neighbor Networks**

Competitive Advantage Local and Personal

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Mama may have,  
Papa may have,  
But God bless the child that's got his own.

from "God Bless the Child"  
Billie Holliday and Arthur Herzog Jr.  
recorded by Billie Holliday in 1941  
first sung by Billie Holliday in 1939

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## **References**

# Prologue

The moral I take away from this book is a bit of Confucian wisdom often ignored in social network analysis: “Worry not that no one knows you, seek to be worth knowing.”<sup>1</sup> The old saying speaks to a tension we all feel at one time or another, a tension between hope and suspicion. The hope: people are rewarded for their ability and effort. The suspicion: rewards go to people with well-connected friends.

I present evidence on analysts, bankers, and kinds of managers showing that rewards in fact do go to people with well-connected colleagues. Look around your organization. The individuals doing well tend to be affiliated with well-connected colleagues.

The advantage obvious to the naked eye is spurious. It disappears when the individual's own characteristics are held constant. Well-connected people have their own interests. They do not have to affiliate with people who wish to affiliate but bring nothing to the affiliation. The research to be presented shows that affiliation with well-connected people adds stability but no advantage to a person's own connections. Advantage is concentrated in people who are themselves well-connected. Advantage is a phenomenon local and personal. In the words of Confucian disciples, “seek to be worth knowing.” For readers more down home, there is the immortal Billie Holliday, “God bless the child that's got his own.”

This book is a trail of argument and evidence that leads to the conclusion that individuals make a lot of their own network advantage. In the end, the social is affirmed, but with an emphasis on individual agency and the social psychology of networks. The network around you is not a device separate from you. You are woven into it. It is a trellis to friends and colleagues on which certain people develop

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<sup>1</sup>My phrasing is colloquial for a contemporary audience. Sources are given in the note at the end of the chapter.



and others decay. Certain network structures develop people more adept at certain kinds of tasks. The research to be presented gives new emphasis to Coleman's (1988) initial image of social capital as a forcing function for human capital.

I wrote this book for colleagues interested in a new angle on familiar data, and as a supplemental reading in graduate courses on social networks, stratification, or organizations. I presume that the reader is familiar with the imagery of network brokers, bridges, and relations embedded in closed networks. The book began as a by-product of another project, Brokerage and Closure (Burt, 2005), in which key properties of what we know about the network structure of social capital were brought together in a four stylized facts. Reviews of what we know highlight where we are ignorant, and on my long “need to figure this out” list following Brokerage and Closure was a question about spillover: Given the evidence of social capital in the immediate network around a person, how does competitive advantage spread between adjacent networks? I was looking for new kinds of evidence to corroborate the evidence reviewed in Brokerage and Closure.

The project I had in mind was a cameo — one of those projects intended to reinforce basic results elsewhere. For a while, I put it aside as a discursion that could be quickly executed, or could be given as an exercise to a graduate student to help flesh out a rookie vita. I anticipated producing a book chapter, or an article in a specialty journal; nothing that would break new ground, but something that would broaden and reinforce the foundation on which I built the review in Brokerage and Closure.

What I expected to be an innocuous implication turned out to be complicated and consequential. The empirical results on spillover from neighbor networks had implications for how we conceptualize, study, and apply network concepts of social capital.

The empirical results on network closure turned out much as I expected. The results are an incremental extension of previous research. There are interesting subtleties, such as spillover closure promoting brokerage, but the primary finding is that closure in the immediate network around a person is reinforced by closure in the broader network among friends of friends. The closure results are completely

consistent with the broad review in Brokerage and Closure, anchored on Coleman's (1988, 1990) discussion of closure as social capital and Granovetter's (1985, 1992) broader discussion of embedding. At the same time, the results highlight the significance of a closure dimension rarely discussed in social-capital discussions of closure: social monopoly. As much as reputation and network stability are enhanced by dense connections within a closed network, stability is further enhanced by the network having a monopoly on its members indicated by their lack of contacts outside the network.

In contrast, the empirical results on network brokerage were a surprise. More, the results raised troubling questions about the mechanism by which brokerage has its effect. I expected to see advantage spill over between adjacent networks. Given the known advantage of friends in separate groups through whom you have access to diverse information, and given ready connections across the world through the internet and wireless communication, it is a short step to conclude that network-advantaged access to information would be enhanced if your friends themselves had networks of scattered contacts providing even broader access. Well-connected friends should provide some advantage over having ill-connected friends. How much advantage was an empirical question, but I expected some advantage. I was surprised to find no advantage at all. I wrote up my early results and submitted them in 2005 for publication (Burt, 2007), then began the deeper analysis reported in this book. The early results are corroborated and generalized here. The social psychology of networks moves to center stage and personal responsibility emerges as a key theme. The competitive advantage of brokerage does not come to people who passively wait for the network to deliver it. The advantage provided by network brokerage depends on personal engagement with conflicting opinion and practice.

What you have in this book is a line of work arriving at a branch in the road. Next steps could go this way or that. Forced to make a consequential choice, I use contrasting study populations and extensive data displays to be confident in taking the right path. I use generic procedures so that others can readily replicate the evidence. The diverse study populations provide grounds to talk about how the results should vary across the populations if alternative mechanisms were

responsible for the spillover I observe. On the replication point, I include detailed appendices on the network data and their use to measure social structure.

The data collection and analyses reported here were supported by work with private clients. I am grateful for summer support provided by the University of Chicago Booth School of business that allowed me to work on the book free of consulting obligations.

Argument and evidence here have been improved in response to colleague comment. Foremost among these is Edward C. Smith. I was fortunate to have Ned read the manuscript from beginning to end to help identify blocks of choppy text and ambiguous links in the argument. Ned worked with me as a Teaching Assistant for two years (and was voted one the best by Chicago's Executive M.B.A. students), so he came to the manuscript as an expert, knowing the material and having successfully communicated it. In addition, I am indebted to the patience and curiosity of colleague audiences at the 2007 Distinguished Scholar lecture for the Organization and Management Theory division of the Academy of Management, an Organization Behavior and Industrial Relations workshop at the University of California at Berkeley Haas School of Business, the 2007 "Management and Social Networks" conference at the Groupe ESC Clermont Graduate School of Management, an Organizations and Markets workshop at the University of Chicago Booth School of Business, the 2006 "Search and Diffusion in Networks" conference at Cornell University, a Sociology Department seminar at Duke University, the 2005 and 2008 Intra-Organizational Network Conferences at Emory University and the University of Kentucky, the "Age of Networks" speaker series at University of Illinois Center for Advanced Study, a Strategy workshop at INSEAD Fontainebleau, an Organization Behavior workshop at INSEAD Singapore, an Information Systems Group seminar at the New York University Stern School of Business, the 2008 Nobel Symposium "Foundations of Organization," the 2007 Distinguished Speaker lecture at Northwestern University's Institute on Complex Systems, the Nuffield College Sociology Seminar Series at Oxford University, a research workshop at the University of Pennsylvania Wharton School and the 2006 "Networks in Context" conference at the University of Pennsylvania Department of Sociology, a

Distinguished Scholar lecture at the University of Pittsburgh Katz School of Business, an Economics and Business seminar at Universitat Pompeu Fabra, the Economics/Sociology workshop at Princeton University, a research seminar at Queen's University School of Business, the Russell Sage Foundation Working Group on Formation and Decay of Economic Networks, the 2006 "Annenberg Workshop on Network Theory" at the University of Southern California, the 2006 annual Sunbelt Network Conference, a strategy workshop at the University of Toronto Rotman School, and the Network Roundtable at the University of Virginia McIntire School.

The book includes material adapted from earlier publications. Chapters 2, 3, and 4 each contain bits from "Secondhand brokerage: evidence on the importance of local structure for managers, bankers, and analysts," Academy of Management Journal 50 (2007): 119-148. Chapter 3 contains a section from "Structural holes and good ideas," American Journal of Sociology 110 (2004): 349-399. Chapter 5 draws on "Industry performance and indirect access to structural holes," Pp. 315-360 in Advances in Strategic Management, edited by Joel A. C. Baum and Timothy J. Rowley, Elsevier (2008). Chapter 6 draws on "Closure and stability: persistent reputation and enduring relations among bankers and analysts," Pp. 100-143 in The Missing Links: Formation and Decay in Economic Networks, edited by James Rauch, Russell Sage Foundation (2007). Chapter 7 contains material from "The gender of social capital," Rationality and Society 10 (1998): 5-46. Chapter 8 contains material from "Actor interests in a social topology: foundation for a structural theory of action," Sociological Inquiry 50 (1980): 107-132. Appendix G contains material from "Detecting role equivalence," Social Networks 12 (1990): 83-97, "Social contagion and social structure," by R. S. Burt and Gregory A. Janicik, Pp. 32-49 in Networks in Marketing, edited by Dawn Iacobucci, Newbury Park: Sage (1996), and from "The social capital of opinion leaders," Annals of the American Academy of Political and Social Science 566 (1999): 37-54.

## NOTE: SOURCES

The bit of wisdom cited at the top of the chapter is from the second substantive sentence in Verse 4.14 of The Lun Yü, also known as The Analects, a collection of snippets from disciple discussions with or about Confucius. Wording varies across translators and revisions, but obedience is the consistent theme: good people do good work without meddling in the distribution of rewards. My phrasing in the text is colloquial for a contemporary audience. There is no single correct translation into English. Waley (1938:96) provides a widely-circulated translation: “The Master said. He does not mind not being in office; all he minds about is whether he has qualities that entitle him to office. He does not mind failing to get recognition; he is too busy doing the things that entitle him to recognition.” Brooks and Brooks (2001:16) translate from an earlier version more likely reflecting Confucius’ original words: “The Master said. He does not worry that he has no position; he worries about whether he is qualified to hold one. He does not worry that no one recognizes his worth; he seeks to become worthy to be recognized.” The Confucius Publishing Company website [www.confucius.org/lunyu/ed0414.htm](http://www.confucius.org/lunyu/ed0414.htm) provides multi-lingual translation, the English of which is: “Confucius said. Do not be concerned when without official position, be concerned with where a stand is established. Do not be concerned when not appreciated, seek what can be appreciated.”

# One

## Introduction

If social networks can be an advantage (the well-connected do well), and networks are jointly owned by the people in them (not equally, but jointly), there should be advantage to affiliation with well-connected people. Your neighbors should matter. On the first point, we know quite a bit about social networks creating competitive advantage for certain people while holding back others. We know that opinion and behavior move between people adjacent in social networks. Does advantage work the same way? Is there advantage to affiliation with the well connected?

The common-sense answer is yes: Well-connected neighbors can be a source of opportunity and resources. This bit of common sense is nicely illustrated by a pair of quotes Rowley and Baum (2004:122) offer from their interviews with investment bankers: “information and access to it are king . . . being close to the source is the name of the game. . . . I don’t have time to know everyone, but I need to be close to those that have the best contacts.” “The best players in the industry build reputations by getting the biggest clients and controlling information, and carefully passing it out to others. It makes you a hot commodity, like a hot concert ticket or restaurant — everybody wants some.” Well-connected contacts also can be a helpful signal. They signal to observers that you have standing among the right people. When once asked to invest in a friend’s new venture, Baron de Rothschild is said to have replied that he would not invest, but would walk arm-in-arm with his friend across the exchange floor. In short order, there would be investors to spare. People observing the pair would infer that Rothschild had thrown into the venture, which would ensure the venture’s success. When affiliation has obvious benefit, it can be expensive. People who obtain exceptional prerogatives through affiliation often pay with selfless loyalty. Examples are Court Jews in Baroque Germany, Christian renegades in the Ottoman Empire, royal

mistresses and eunuchs in the Orient more generally. Claims to beneficial affiliation can backfire in ways long familiar. Well before the Baron de Rothschild or Suleiman the Magnificent, Aesop spoke in ancient Greece of a pretentious monkey claiming social connections he did not have, drowned by an otherwise philanthropic dolphin. The advantage of affiliation, the cost of that advantage, and retribution for false claim to affiliation, are illustrative costs and benefits of neighbor networks. You are somehow made better off, or dragged down, by the networks around your neighbors.<sup>1</sup>

The performance effects of neighbor networks are substantively interesting in their own right, but uniquely important for research. Social processes difficult to discern within one's own network can be distinguished in the spillover from neighbor networks. The extent to which advantage spills over from neighbors is a criterion that can be used to determine the process by which social networks constitute social capital. This book is an exploration of that criterion. I begin by distinguishing your network from the networks around your neighbors, offer three reasons for wanting to know how advantage spills over from neighbor networks, then sketch a quick overview of the chapters to come.

## **FRAMING THE QUESTION: PEOPLE YOU KNOW VS THE PEOPLE THEY KNOW**

Figure 1.1 is a sociogram of the network around a person, ego, whose performance is to be explained. Dots represent people. Lines represent relationships. A direct contact is someone with whom ego communicates directly. There are eight in Figure 1.1. The eight direct contacts define ego's immediate network. I use a possessive form, but of course, the network does not "belong" to ego. It is co-owned with the contacts. A more accurate label would be "the interface between ego and social structure," but the label is clumsy. The structure of relations among the contacts defines the immediate network around ego, which is typically what we mean when we talk about a person's network (also discussed as ego's personal network, or an ego network).

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<sup>1</sup>Sources for the stories in this paragraph are given in the note at the end of the chapter.

### **Social Capital in the Immediate Network: Direct Access to Structural Holes**

Inherent in the structure of ego's network is a level of social capital, a competitive advantage that ego enjoys as a result of the network. The advantage is conceptualized using structure as a proxy for information. The proxy is based on two facts taken from a vigorous stream of research on communication and influence that began after World War II (e.g., Festinger, Schachter, and Back, 1950; Asch, 1951; Lazarsfeld and Katz, 1955; Schachter, 1959; Coleman, Katz, and Menzel, 1957 — all work to be discussed in this book, all classics that still shape today how scholars think about communication and influence): (1) People cluster into groups as a result of interaction opportunities defined by the places where people meet; the neighborhoods in which they live, the organizations with which they affiliate, the projects in which they are involved. (2) Communication is more frequent and influential within than between groups such that people in the same group develop similar views of the history that led to today, similar views of proper opinion and behavior, similar views of how to move into the future. People tire of repeating arguments and stories explaining why they believe and behave the way they do. They make up short-hand phrases to reference whole paragraphs of text with which colleagues are familiar. Jargon flourishes. Not only jargon, but a whole system of phrasing, opinions, symbols and behaviors defining what it means to be a member of the group. Below the arguments and experiences labeled are many awaiting a label, more understood than said within the group. What was once explicit knowledge interpretable by anyone becomes tacit knowledge meaningful only to insiders. With continued time together, new combinations and nuances emerge to make the tacit knowledge more complex, making knowledge more difficult to move to other groups. Information in the group becomes "sticky" (von Hippel, 1994). Much of what we know is not readily understood beyond the colleagues around us. Inside the tribe, one only needs to say the punch line of a popular joke to elicit bonding recollection of the whole story. Explicit knowledge converted into local, tacit knowledge makes information sticky such that holes tear open in the flow of information between groups. These holes in the social structure of communication, or more simply "structural holes,"



are missing relations that inhibit information flow between people (“like an insulator in an electric circuit,” Burt, 1992:18).

———— Figure 1.1 About Here ————

Structural holes distinguish two network sources of advantage: brokerage and closure. These are forms of social capital in as much as they originate, evolve, and decay as a function of the surrounding network. Closure is about staying on your side of a structural hole. It is about the benefits of protection from variation in opinion and behavior, protection provided by focusing on connections with your own kind. Structural holes are boundary markers in the division of labor. By not having to attend to the interpretations of people beyond the boundary around my specialty, I can focus on deepening my knowledge of what I already know pretty well, becoming more efficient in doing what I already do. Without structural holes, we would be overwhelmed with the diversity of knowledge available. If structural holes were taken away, we would quickly re-create them to re-establish a sense of control over our lives. That desire to live within a world understood is a source of advantage for the hardy souls among us who rise above it. Brokerage is about the benefits of exposure to variation in opinion and behavior provided by building connections across structural holes. Network brokerage and closure both provide advantage, but by different mechanisms toward different performance goals. To use colloquial business terms, network brokerage drives top-line growth and closure drives bottom-line growth. People, process, product, and market enhancements provided by network brokerage grow the business. Labor, management, and speed efficiencies provided by closure cut costs so that business is more profitable.

In this book, I focus on network brokerage, measured in terms of opportunities to coordinate across structural holes. Where everyone you know knows everyone else, you have no access to structural holes. The more disconnected a manager’s contacts, the more likely her network spans structural holes in the surrounding organization and market. In Figure 1.1, for example, ego’s five contacts to the east have no connections with one another and their contacts have no connection with one another. The eastern part of the network is rich in structural holes. Because the contacts to the east have no connection with one another, they are more likely to operate with different ideas and practices, taking for granted different ways of looking at problems. People whose

contacts are all in the same group know only their own group's opinion and practice. People who connect across structural holes (call those people network brokers, connectors, hubs, or entrepreneurs) are exposed to the diversity of opinion and behavior in the surrounding organization and market. Such people are presented with opportunities to coordinate people otherwise disconnected, and derive ideas or resources from exposure to contacts who differ in opinion or the way they behave. Connecting across more holes means broader exposure. Broader exposure provides a vision advantage in selecting early between alternative ways to go, synthesizing new ways to go, framing a proposal to be attractive to needed supporters, and detecting likely supporters/opponents to implementing a proposed way to go. This is not to say that every connection across a structural hole is valuable. Coordination between some groups does not warrant the cost. Many novel combinations of existing opinion or practice are worthless. Network brokerage is not a guarantee. It is a probability: Connecting across structural holes increases the risk of productive accident — the risk of encountering a new opinion or practice not yet familiar to colleagues, the risk of envisioning a new synthesis of existing opinion or practice, the risk of finding a course of action through conflicting interests, the risk of discovering a new source for needed resources. Bridging structural holes creates a vision advantage in detecting and developing productive opportunities. The advantage is manifest in standard performance metrics. Network brokers enjoy more-positive evaluations than their peers, higher compensation, and faster promotions.

Questions about the returns to network brokerage lead me to network closure later in the book. Closure is measured by the extent to everyone in a network is connected to everyone else, through a central person in the network, or through direct connections between people in the network. In Figure 1.1, ego and his three contacts to the west are densely connected, in part directly and in part through several friends of friends. Closed networks are detrimental with respect to the vision advantage of brokerage, but can be an advantage with respect to coordinating work. Reputation is the mechanism by which closure delivers its effect. As connections close the network around a manager, people are more informed about one another and benchmark opinion and behavior against one another. Reputations emerge to distinguish the

peripheral from the best among us. I am using reputation to refer broadly to the vertical axis of social organization: Some people are prominent, respected members of a network. Other people are on the periphery, barely considered members of the network. To preserve reputation among colleagues well-informed about one another's behavior, people are careful to behave well (which lowers the risk of trust within the network) and people work to keep up with colleagues (which lowers cost within the network by increasing the quality and quantity of work and decreasing the need for a supervisor to monitor individual behavior). Closure's advantage is manifest as enhanced collaboration, productivity, and stability that speed a group down its learning curve.

### **Social Capital from Your Neighbor's Network: Indirect Access to Structural Holes**

The preceding cryptic remarks are fleshed out in the forthcoming chapters. I need the overview to frame the research question for this book: What about contacts beyond the immediate network?

Beyond the immediate network are numerous indirect contacts, friends of friends at various distances. In Figure 1.1, hollow dots represent the 21 people with whom ego has indirect contact through his eight direct contacts. Dashed lines represent connections with and among the indirect contacts. The network around each of ego's contacts is a "neighbor network." Ego's three direct contacts to the west in Figure 1.1, for example, are interconnected through friends of friends. To the east, each of ego's direct contacts leads to indirect contacts disconnected from the others. I shaded an area containing the network around one of ego's contacts. That contact should be doing well since her network is rich in structural holes (no connections between her six contacts). As managers vary in their direct access to structural holes within the immediate network, managers vary in their indirect access to structural holes among friends of friends.

I want to know the extent to which advantage spills over between adjacent networks such that neighbor networks are a factor to consider in social capital. Does any of the network-induced success of the shaded-area colleague in Figure 1.1 spill over to ego? Does ego benefit from the stability expected in the closed network among

his western contacts? Moreover, if neighbor networks affect ego's performance, how does the neighbor-network effect compare to the effect of ego's own network? The effect of ego's network could be magnified or reversed by effects, even small effects, from a multitude of neighbors.

## **SO WHAT?**

Given replicated results on the network structure of social capital, measuring the effects of neighbor networks might seem to be little more than an academic exercise, a consistency check on a well-established theme. There is some truth to the suspicion, but three issues press for taking a closer look at neighbor networks.

### **Business Practice**

First, many admired business practices are based on an assumption that neighbor networks do matter. Businesses have made increasing use of network ideas in their efforts to integrate operations. Employees are encouraged and expected to "network" through colleagues. Colleges, professional schools, and companies tout the value of access to their alumni network. "Mentoring" programs are based on well-connected senior people facilitating the recognition and development of promising junior people. "Onboarding" programs use well-connected insiders to facilitate the social integration of new hires (e.g., Cisco's famous "manager of the intangibles," a well-connected insider appointed to facilitate the social integration into Cisco of employees from a company just acquired by Cisco). These programs, and the many like them, assume that advantage spills over between neighbor networks. If advantage does not spill over, then these programs operate somewhere between irritating and irrelevant. For any such program that has proven valuable, the factor responsible for its value would have to be something other than neighbor networks.

### **Research Design**

In contrast to business practice, much of the research evidence on returns to network brokerage rests on an assumption that neighbor networks do not matter. The usual survey-network research design involves gathering data on relations with and among

direct contacts to define the immediate network around a survey respondent — the solid lines and dots around ego in Figure 1.1 (for details, see Appendix A on measuring networks). Measures of structure in the immediate network, such as network size and density, are then added to traditional stratification models predicting the respondent's achievement and rewards. This can be a powerful research design when used with a stratified random sample of managers in a large heterogeneous population (e.g., Burt, 1992; Podolny and Baron, 1997; Hansen, Podolny, and Pfeffer, 2001; Mizruchi and Sterns, 2001; Seibert, Kraimer, and Liden, 2001). The same research design underlies DiMaggio and Louch's (1998) use of the General Social Survey, a national probability survey, to describe closure effects on preferences for buying and selling "within network" items such as a house or a car. Structure beyond the respondent's immediate network (the dashed lines and hollow dots in Figure 1.1) is ignored in these research designs, as in other studies based on the same survey-network research design. If neighbor networks are a factor in social capital, the above research is wrong in its assumption, the reported estimates of returns to network structure are inconsistent, and much of what has been taken as evidence is called into question.

### **Social Capital Process Clues**

Third, neighbor networks are interesting for the criterion that spillover provides to identify processes by which social networks constitute social capital. Empirical success in predicting performance with network models has far outstripped our understanding of the way information and behavior in networks are responsible for network effects. Information and behavior are almost never observed directly. Both are inferred from the structure of relations in which they occur. As discussed above, information is assumed to have a clustered distribution in which information is relatively homogeneous within groups and heterogeneous between groups. That clustered distribution is assumed to create a vision advantage for people who have connections across groups because they are exposed to a broader range of alternative opinion and behavior, so they are more likely to see alternative ways to go, synthesize new ways to go, and see a broader range of ways to support an initiative. Finally, it is assumed that people who see more opportunities are more likely to act on at least one of the opportunities, so the vision

advantage creates an achievement advantage manifest in evaluations and compensation as performance metrics.

Thus, structure has been used as a proxy for process assumptions about information, opportunity, and behavior. Using network structure as a proxy for process has facilitated research because structure can be measured more reliably and at lower cost than would be true of measuring information or behavior directly, and research can focus on the more interesting task of explaining performance differences. Given success in predicting performance with network structure, the process responsible warrants closer inspection, and we now see papers reporting ethnographic description of network brokerage (Obstfeld, 2005), richer survey data on network content and brokerage (e.g., Rodan and Gallunic, 2004), authoritative archival data on network content and brokerage (Aral and Van Alstyne, 2007), and rigorous speculation with network simulations of brokerage processes (e.g., Centola and Macy, 2007; Buskens and van de Rijt, 2008; Reagans and Zuckerman, 2008). The elaborate research designs and novel research strategies are an exciting development, but more can be done than has been done with existing data. Familiar cross-sectional and panel data can be used to measure the extent to which advantage spills over from neighbor networks, and spillover can be used to make inferences about network processes otherwise indistinguishable in the immediate network around ego. That is the central point developed in the next chapter.

## **OVERVIEW OF THE BOOK**

In the next chapter, I introduce network measures of direct versus indirect access to structural holes, then describe how spillover evidence can be a criterion for distinguishing three broad categories of processes potentially responsible for social capital: global processes (indicated by increasing spillover from information flow expanding exponentially through friends of friends), local processes (indicated by decreasing spillover from information flow only meaningful between people who are socially close), and personal processes (indicated by a lack of spillover because

information flow is irrelevant to advantage except as it leaves behind a by-product of learning to communicate across structural holes).

Chapters 3 and 4 introduce the most surprising results, the lack of advantage from affiliation with network brokers. Managers in five diverse study populations show a strong correlation between performance and affiliation with well-connected colleagues, but the correlation is spurious. The correlation disappears when ego's job and her own network are held constant. The evidence in Chapter 3 is from populations in which groups are separated by strong boundaries. People focus on others like themselves. Knowledge is unlikely to move easily across groups. Such "balkanized" populations are the places in which local processes are likely to be important. The first population is composed of employees active in the Asia-Pacific launch of a new software product. The employees are segregated by regional divisions. A second population is the supply-chain organization in a large electronics company segregated by geography and technology. In Chapter 4, I turn from balkanized populations to populations integrated through dense ties to a single, central elite. In populations so integrated, knowledge should move more easily through the short connections that span the population, so indirect access to structural holes among friends of friends is more likely to be valuable. The three study populations in Chapter 4 are a human resource organization, investment bankers in a financial organization, and senior analysts in the organization. My research results are consistent across the five very different populations in Chapters 3 and 4: Performance increases with direct access to structural holes and has no association with indirect access. Therefore, when describing the advantage provided by affiliation with network brokers, I choose at the end of Chapter 4 to use the diminutive label "secondhand" brokerage — rather than spillover, pre-owned, leveraged, or some other more positive adjective.

The negligible spillover between adjacent manager networks is consistent with personal processes and distinct from what would be expected from local or global processes. It is not enough to affiliate with known brokers. Such affiliation should be an advantage if brokerage creates advantage by providing quick, early access to distant, novel information. Consistently negligible returns to secondhand brokerage in diverse populations lead me to conclude that the advantage of network brokerage is not about

quick, early access to distant, novel information so much as it is about what happens to a person who has to manage communication across a network full of structural holes. Either way, ego has a vision advantage in detecting and developing rewarding opportunities. The question is whether the vision advantage comes from better glasses or better eyes. A network that spans structural holes could provide a manager with better information access and control, which would be an advantage, or it could, by exercising one's ability to manage heterogeneous information, make the managers better able than less 'exercised' peers to see opportunities, which would amount to the same advantage. Brokerage exposes ego to diverse opinion and behavior in other groups. In the course of managing contradictory relationships, ego develops cognitive skills of analogy and synthesis, and emotional skills for reading, engaging, and motivating colleagues. One is perhaps less troubled by sharp differences in opinion or practice. One becomes, perhaps, more skilled in analogy and metaphor in order to communicate across differences. Whatever specific skills are involved (and I look into some in the final chapter), brokerage is not valuable for the information it provides so much as it is valuable as a forcing function for the cognitive and emotional skills required to manage communication between colleagues who do not agree in their opinion or behavior. It is the cognitive and emotional skills produced as a by-product of bridging structural holes that are the proximate source of competitive advantage. In a phrase, brokerage opportunities could be a forcing function for human capital (the theme in Coleman's, 1988, initial network discussion of social capital in the creation of human capital).

The conclusion is attractive on several counts: It is simple, surprisingly robust, puts a welcome emphasis on personal responsibility at the same time that it greatly simplifies the study of strategic behavior in networks, creates an incentive for social psychologists to join in the expanding work on network brokerage, and creates an incentive for the people working on the structure-performance association to seek out social psychology as a corollary competence.

On the other hand, the conclusion creates a problem. The fact that managers do not benefit from indirect access to structural holes raises a question about the traditional network-theory strength of consistency across levels of analysis. It is not the empirical



fact of secondhand brokerage that is troubling so much as the fact's implication that returns to brokerage within the immediate network are a result of social psychological processes. The role of cognition and emotion in network brokerage makes sense when applied to people. It is not obvious how the metaphor of sentient individuals applies at the macro level. Organizations, and the industries and regions in which they operate, are assemblies of people who individually think and feel. To attribute thinking and feeling to macro units such as organizations, industries, or regions, requires an unattractively anthropomorphic metaphor. To continue the above "better glasses or better eyes" metaphor, the "better glasses" metaphor generalizes readily to the macro level of organizations and markets. The "better eyes" metaphor, with its emphasis on enhanced cognitive and emotional skills, does not. It would be useful to see macro-level evidence on performance and indirect access to structural holes.

That is my purpose in Chapter 5. I describe a network brokerage model at the industry level that is analogous to the model used to describe manager performance in Chapters 3 and 4. I use the model to describe performance and producer access to structural holes among suppliers and customers based on data in the 1987 and 1992 benchmark input-output tables of the American economy. The manager and industry evidence offer complementary strengths (similar returns to brokerage at the two levels of analysis, greater variety in the manager networks, less endogeneity in the industry networks). In contrast to the manager evidence showing no performance association with indirect access to structural holes, there is clear industry evidence of positive association. About 24% of the industry-structure effect on performance can be attributed to structure beyond the industry's own buying and selling, to networks around the industry's suppliers and customers.

At the same time, manager and industry evidence are similar in important ways. I conclude in Chapter 5 that the industry evidence is not qualitatively distinct from the manager evidence so much as it describes a more extreme business environment. I speculate on information and inhibition as factors making the industry environment more extreme (industry information codified into routines can move more quickly, further, with more accuracy, and industry buying and selling is less inhibited by social norms of proper behavior). One thing is clear: a wide range of business environments — from

corporate bureaucracies up through the mature capital markets in which investment bankers and analysts work — show no performance advantage to brokerage beyond the immediate network of direct contacts. There is a detectable performance advantage at the extreme of industry market relations; but short of that extreme, advantage is limited to the immediate network of direct contacts.

Chapters 6 and 7 report on closure effects from neighbor networks. In Chapter 6, relations and reputations are analyzed over time among the investment bankers and analysts introduced in Chapter 4. As expected, relations are enhanced and reputations more stable when colleagues are connected so as to close the network around participants.

More, and in contrast to brokerage, closure's effect is strengthened by closure in neighbor networks. The evidence on spillover closure is consistent with local processes, processes in and just-beyond the immediate network around a person. The evidence is distinct from what would be expected if spillover closure resulted from population-spanning global processes, or was a by-product via personal processes. The evidence is reassuring more than surprising since spillover effects were expected from closure. The vision provided by brokerage enlightens ego. The reputation provided by closure aligns ego with neighbors. Enlightening ego is a less social outcome than aligning neighbors, so it is not surprising to see closure spillover between neighbor networks.

Closure spillover from neighbor networks emphasizes an aspect of closure that is rarely discussed. The trust and alignment associated with closure is a story that can be told in two ways; as a social integration story about strong connections within the closed network, or as a social monopoly story about the lack of strong connections beyond the closed network. The social integration story lends itself to positive rhetoric about community and strong relationships. The social monopoly story is more nakedly a story about control, access denied. Closure is often discussed, and closure strategies proposed, in terms of the positive, social integration story. The social integration story is valid, but the results in Chapter 6 show that social monopoly matters. Closure is about control. Whatever the closure within the immediate network around ego, each person in the network — each of ego's neighbors — is a potential backdoor through

whom contradictory opinion and practice can enter to disrupt trust and alignment within the network. Having neighbors embedded in their own closed networks significantly reduces the risk.

Closure spillover in Chapter 6 sets the stage for the analysis in Chapter 7. Chapter 7 is about what would seem to be an obvious case of managers benefiting from affiliation with a network broker — which would contradict the secondhand brokerage conclusion in Chapter 4. Communication across groups can be difficult when the communicator is viewed with suspicion. In some organizations, certain kinds of people are deemed outsiders in the sense that they are denied the advantages of connecting across groups. Sometimes women are the outsiders. Sometimes age is the criterion with young men excluded as outsiders until they prove themselves. Sometimes the criterion is nationality, or religion. Whatever the criterion, network models provide a useful diagnostic identifying the people deemed outsiders in a specific organization: Outsiders are the people whose careers are slowed or reversed when they try to broker connections across structural holes. The corrective action is simple to do and has demonstrable benefit: affiliate with an insider rich in structural holes who legitimates outsider access to insider opportunities for brokerage. In Chapter 7, I discuss such an insider as a strategic partner. Outsiders benefiting from affiliation with an inside broker look like an exception to the finding in Chapters 3 and 4 that managers do not benefit from affiliation with network brokers. Outsiders clearly do. In fact, this is one of those exceptions that proves the rule. Strategic partners do not create advantage by affecting ego. Partners create advantage by making ego more acceptable to colleagues. The spillover effect of strategic partners is an instance of strategic partners closing the network to facilitate trust. As evidence of closure inducing trust, the positive effect of strategic partners does not contradict the negligible returns to secondhand brokerage in Chapters 3 and 4. It corroborates the trust and alignment returns to closed networks documented in Chapter 6.

Driven by the evidence of local and personal processes, I speculate in the concluding chapter on the role individual people play in the process by which network structure constitutes social capital. This is the question of agency: How much do individuals matter relative to the social structure around them? I begin with a lament, as

have many others, on the lack of attention to agency. Scholars typically assume agency away or hold it constant in order to focus on the network connection with performance. That performance connection is my focus in the first seven chapters here. However, networks also affect what people want to do, what they see as valuable. How much of the performance association with networks is due to differences in network advantage versus individual differences in seeing or seizing network advantage? Action that can seem worthwhile to one person can seem trivial, even status-eroding, to another person. Are networks the performance factor to manage, or would it be more effective to manage incentives to act on network advantage? Network advantage is worthless until someone acts on it.

In Chapter 8, I argue that networks create a pressure on ego to act by defining the frame of reference through which ego evaluates alternative actions. Ego is lured to action by the prospect of moving ahead and pushed to action by fear of falling behind. Preferences are bent in predictable ways by network context. Connection between felt and actual resources is taken from psychophysics. Concepts of structural and role equivalence in sociology provide context. Context dependence is neither new in general, nor in the particular discussed here. With respect to the generally familiar idea of context dependence, the proposed bent preference model is promising in its simplicity, precise description, and compatibility with economic, psychological, and sociological analysis. The model combines marginal evaluation from economics and psychophysics with the sociology of network structure, shifting context from psychophysics lab to social network, extending contagion from behavioral communication to symbolic role play, and defining motivation in terms of advantage relative to peers in a network. The proposed model would fall under the relative income hypothesis in economics, social comparison theory in psychology, and reference group theory and the concepts of relative advantage and deprivation in sociology. With respect to the particular model proposed, I draw on earlier work that is timely to revisit because diffusion research has clarified the network condition used in the model as a frame of reference for perception, accumulating evidence on the performance correlates of network structure has widened the audience interested in the motivation question,

and the evidence in the first seven chapters brings individual differences in cognition and emotion to center stage in the social capital of network structure.

I derive from the model three broad hypotheses around which Chapter 8 is organized. First, the motivation that networks create is disproportionately about fear, specifically, fear of falling behind peers. In defining the frame of reference through which ego evaluates alternative actions, the network around ego creates pressure to act. Ego is lured to action by the prospect of moving ahead and pushed to action by fear of falling behind. The bent preferences model predicts that the push is stronger than the pull; the network pressure on ego to act is less about the lure of gain, than the fear of loss. The following network fear hypothesis is implied: The feelings of loss as peers overtake ego are more severe than the feelings of gain in overtaking peers, but the feelings of loss fade as peers continue to do well. This hypothesis is a bridge between the sociology of networks and the psychology of loss versus gain. The prediction is that feelings of loss versus gain are not a psychological primitive. Rather, the feelings are in some large part a function of the social context in which prospective action is evaluated.

Second, networks differ predictably in the intensity of fear they generate. The difference between felt loss and gain predicted by the first hypothesis is larger for people with more obvious peers. With peers defined by a network criterion of structural equivalence, more obvious structural equivalence makes falling behind peers more obvious, which ensures the pain, and so fear, of relative deprivation. Network brokers are relatively unique within their networks. There is often no one structurally equivalent to a broker. Brokers having no structurally equivalent peers are free from the competitive pressure of peers, so they are less subject to the pain of relative deprivation, and therefore more free to evaluate and espouse something new for its benefits. An intrepid broker hypothesis is implied as a contingency version of the network fear hypothesis: When evaluating a new idea or practice, network brokers are more motivated by the lure of gain, and less troubled by a fear of failure. I discuss this hypothesis with respect to interpersonal influence, opinion leaders, displayed emotion, and high-performance teams.

Where the second hypothesis describes correlates of the freedom provided to brokers by their lack of peers, the third describes corrective moves expected when brokers feel the need for a social frame of reference. Freedom from the competitive pressure of structural equivalence is an incentive to be a broker, but everyone at one time or another needs a social frame of reference to make sense of ambiguous events. The question "Who is like me?" sometimes needs to be answered, presupposing an answer to the identity question "Who am I?" For brokers, the lack of obvious peers means that a social frame of reference has to be found in more abstract images of social structure, implying the following network identity hypothesis: Brokers are less guided by structural equivalence in identifying peers (including claims that they have no peer), and are more likely to be guided by abstract images of social structure in which broker peers are more obvious. I discuss this hypothesis with respect to categorizing people, the social construction of market boundaries, and identity defined in terms of role rather than network.

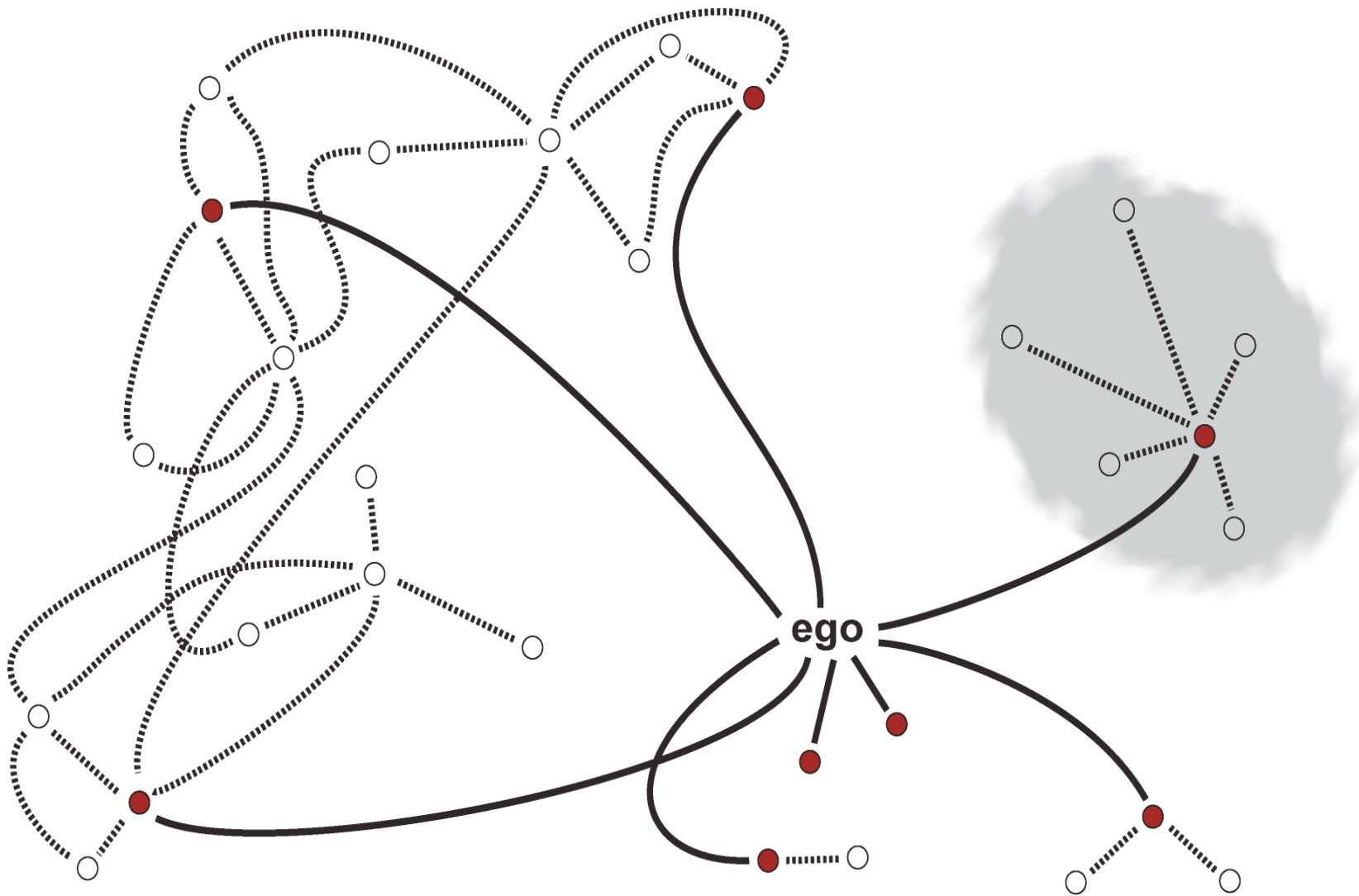
What emerges from the book is a sense of the central role played by social psychology in the network advantage known as social capital. Technological advances have given us the ability to reach across previously unimagined distance, but value is still produced close to home. Despite technological advance, social capital remains a phenomenon local and personal.

A quick historical note is in order before I lay out my argument and evidence. About a half-century ago, the social psychology of organizational life took a leap forward with images of people satisficing under bounded rationality (March and Simon, 1958; Cyert and March, 1963), socially constructing the meaning of events around them (Weick, 1969), with social psychology offering refinements to basic questions about morale, motivation, productivity and efficiency, power and control, leadership and change (Katz and Kahn, 1966). The images of people shaping and reacting to their surrounding situation found fertile ground in organization and management research (Scott, 2004; Scott and Davis, 2007: Chaps. 4, 5). Without detracting in any way from the substance of the 1960s leap forward, I suspect that there would not have been such a leap without the vigorous prior and coterminous wave of research on communication and influence in small groups (which was also foundation on which network models of

social capital developed, see page 3 in this chapter). The 1950s were a golden age of research on small groups, and elements of that golden age inspired the 1960s social psychology of organizational life. I mention the leap forward leveraged on a wave of what we would now call network research because over the last decade, we have had another vigorous wave of research on social networks, research showing a substantial network association with individual, organization, and industry performance. Along the way, we gave individual people little attention as the agents through whom social networks come alive. Evidence from closer study is pushing us back to reconsider our previous lack of attention. The stage is set to re-engage social psychology. The basic questions so long ago sketched by Katz and Kahn (1966) are by our new analytical tools laid open once again. The result is an engaging vista of interesting, consequential, and tractable puzzles. I don't know what will come of social psychology playing a more central role in network studies of social capital, but it is another view, and if the research on network brokerage has shown anything, it is that more lines of attack improve the odds of productive advance.

### **NOTE: SOURCES**

My source for the Rothschild anecdote is Kilduff and Krackhardt (1994), who cite Cialdini (1989) as their source. Cialdini does not give a source, and I could not find a source. The anecdote is perhaps no more than a succinct didactic illustration. Coser (1974) describes examples of people given exceptional prerogatives in return for selfless loyalty. Aesop's fable is "The Monkey and the Dolphin," the gist of which is: "When people go on a voyage they often take with them lap-dogs or monkeys as pets to while away the time. Thus it was that a man returning to Athens from the East had a pet Monkey on board with him. As they neared the coast a storm burst upon them, and the ship capsized. All on board were thrown into the water and had to save themselves by swimming, the Monkey among them. A Dolphin saw the Monkey, and, supposing him to be a man, took him on his back and began swimming towards the shore. When they got near the Piræus, which is the port of Athens, the Dolphin asked the Monkey if he was an Athenian. The Monkey replied that he was, and added that he came from a very distinguished family. 'Then, of course, you know the Piræus,' continued the Dolphin. The Monkey thought he was referring to some high official or other, and replied, 'Oh, yes, he's a very old friend of mine.' At that, detecting the Monkey's hypocrisy, the Dolphin was so disgusted that he dived below the surface, and the Monkey was quickly drowned." The graphic on the book cover is Gustave Doré's 1896 illustration for Jean de La Fontaine's 17<sup>th</sup> century rhyming version of Aesop's fable.



## Figure 1.1: Immediate Network and Neighbor Networks

(Solid dots are direct contacts. Hollow dots are indirect contacts. Solid lines are connections within immediate network. Dashed lines are connections within neighbor networks. Shaded area identifies a neighbor's network.)