When Do Interlocks Matter?: Alternate Sources of Information and Interlock Influence

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The purpose of this study was to investigate when director interlocks affect corporate behavior, and how much influence they exert, by studying the conditions under which their influence varies. Existing theory supports the view that interlocks provide information, which affects firms' adoption of strategies and structures. If interlocks provide information, their influence should diminish to the extent that alternate sources of information are available. We measured the effect of alternate sources of information on the relationship between interlocks and corporate acquisitions. Results show that most alternate sources (e.g., CEO membership in the Business Roundtable) reduce the impact of the interlock, but one source (business press coverage) increases it. Also, information from similar interlock partners is more influential than information from dissimilar interlock partners. Our findings suggest a theory of interorganizational information: the substitutability and complementarity of multiple information sources affect their influence. The implications of our study for interlock and information theories are discussed.

One of the most-studied forms of interorganizational influence is the director interlock, and several theories on their effects have been proposed, including (1) interlocks act as a mechanism for interfirm collusion and cooperation (e.g., Koenig, Gogel, and Sonquist, 1979; Burt, 1983), (2) they enable firms (especially banks) to reduce dependence or coopt, control, and/or monitor others (e.g., Pfeffer and Salancik, 1978; Kotz, 1978; Mizruchi, 1982; Mizruchi and Stearns, 1994), (3) they promote upper-class cohesion (Zeitlin, 1974; Palmer, 1983), (4) they are a mechanism for personal career advancement (Zajac, 1988), (5) they are a source of legitimacy (Selznick, 1957; DiMaggio and Powell, 1983), and (6) they are a source of information about business practices (Useem, 1984; Davis, 1991; Haunschild, 1993) (for a review, see Mizruchi, 1996). Yet despite numerous studies on interlocks and their influence, the issue of whether interlocks actually affect the firms involved remains the subject of much debate, as research has produced mixed and contradictory results (Palmer, Barber, and Zhou, 1995; Palmer et al., 1995; Fligstein, 1995). The control and collusion perspectives suggest that using interlocks to collude with or coopt others improves profitability, yet some researchers have found positive effects of interlocking on firm profits (e.g., Pennings, 1980; Burt, 1983), while others have found negative effects (Fligstein and Brantley, 1992). Mizruchi (1996) suggested that these conflicting findings may be due to ambiguity in causal ordering. That is, interlocking may be both a cause and a result of profitability. There are also many arguments about whether evidence claimed to support interlock theories actually supports them (cf. Palmer et al., 1995; Fligstein, 1995). These mixed findings and other issues with interlock research have led to some strong criticisms (Zajac, 1988; Stinchcombe, 1990). For example, Fligstein and Brantley (1992: 304) argued that interlocks do not influence the firms involved and "just do not predict much that is interesting in the strategic choices of firms."

To address the issue of whether interlocks matter, we ask a more specific question: *when* do interlocks matter? Under

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what conditions do interlocks affect firm outcomes? There has been an assumption in the interlock literature that interlocks will uniformly affect outcomes. We take a more contextual approach, proposing that interlocks are more influential in some situations than others, and some interlock partners are more influential than other interlock partners. We studied this issue by proposing, along with Useem (1984), that interlocks are an influential source of interorganizational information. We expand on this idea by hypothesizing that if interlocks are a source of information, they will be less influential to the extent that alternate sources of information are available. We also hypothesize that some interlock partners are more influential carriers of information than other partners.

Interlocks and Interorganizational Information

The flow of interorganizational knowledge through interlocks is one means through which firms can obtain useful information. Although not dealing specifically with interorganizational information, several lines of research have addressed the concept of organizational knowledge flows. The classic information-processing view (Galbraith, 1973), for example, focused on intraorganizational mechanisms like horizontal communication structures that facilitate information transfer. While there has been much research on interpersonal and intraorganizational information flows, however, there is much less on the flow of interorganizational information. The diffusion of innovation and communication literatures, although primarily concentrated at the individual level of analysis, include some findings that bear on interorganizational information flows. Position in a communication network, for example, has been shown to influence group performance and individual influence (Bavelas, 1950; Leavitt, 1951) and is also likely to affect interorganizational information. Specific information channels and their effect on the diffusion process have also been explored, primarily by Rogers (1995), who discussed how different information channels are important for different types of actors at different stages in the diffusion process. Mass media, for example, is influential in the early stages of diffusion, while interpersonal contacts become more important later (Rogers, 1995). Opinion leaders attend to mass media information and, in turn, spread information to the opinion followers through their interpersonal networks.

Information channels are also likely to be important in the interorganizational diffusion process. The director interlock, in particular, seems to be a potentially influential channel, and several types of influence have been proposed to flow through such interlocks, including general cooptation and control of others (Pfeffer and Salancik, 1978). Researchers have proposed that interlocks are a way for banks to exercise influence over firms (Kotz, 1978), while according to financial hegemony theories, interlocks are a diffuse source of information overlaid on capital flows among firms (Mintz and Schwartz, 1985). In these cases, control over firms is expected to result from the interlock network, yet the evidence for control perspectives is mixed, leading some to propose that interlocks are not used for control at all (Davis, 1996).

Our focus is on the information, rather than on the control effects of interlocks. Most interlock theories, including some of the control theories, are consistent with the idea that interlocks convey information. The theories vary, however, in their emphasis on the relative importance of this information compared with other interlock functions. In some, information is a by-product of other purposes and intentions. For example, although according to Pfeffer and Salancik's (1978) resource dependence theory, interlocking allows firms to obtain valuable information about other firms, the primary function of interlocks is to manage dependence through cooptation and control. Useem (1984) was the first to discuss explicitly the non-control-oriented, informational effects of interlocks. He proposed that interlocks enable managers to achieve an optimal "business scan" of the latest business practices and overall business environment. To support this idea, he cited several executives who said that sitting on other boards and being exposed to the experiences of other firms provided valuable information that these executives then used in their own firm's decisions. Lorsch and MacIver (1989: 27) also discussed the informational effects of interlocks, citing one chief executive officer who said, "serving on a board is a way of seeing how somebody else is doing the same thing you're doing," and another who said, "you learn so much about situations that you, in turn, become faced with." Executives brought firsthand knowledge of the actions of other firms to their own firms through interlock contacts, and this knowledge affected their firms' activities.

If director interlocks are an influential source of information, then one consequence of this information is that we should see firms adopting the practices and structures previously adopted by their interlock partners. Thus, if a focal firm's interlock partners do "X," then the focal firm should be more likely to do "X" subsequently. This relationship has been shown to occur for poison pills (Davis, 1991), campaign contributions (Mizruchi, 1992), mergers and acquisitions (Haunschild, 1993), adoption of the multidivisional form (Palmer, Jennings, and Zhou, 1993), and paying acquisition premiums (Haunschild, 1994). This evidence suggests that, despite criticisms to the contrary, interlocks influence the strategic choices of firms by providing information.

But why is the information conveyed through interlocks so influential? Likely reasons are that interlocks can be inexpensive, trustworthy, credible information sources. Interlocks are low-cost sources in that directors are required for all public firms, and the information that comes from a director is thus an inexpensive by-product of such mandated relationships. Such information need not be actively sought in order to be influential (Mizruchi, 1996). As Rogers suggested, information about innovations rarely comes to individuals from sources they actively seek (Rogers, 1995: 192). The information obtained from an interlock partner is also likely to be credible, and high-credibility sources are more persuasive than low-credibility sources (Hovland and Weiss, 1951). Credibility is likely to be especially high when it relates to activities with which the partner has direct experience. Interlock partner information, especially information relating to direct experience, is also vivid. Vivid information and case-

type examples have been shown to be more influential than pallid, abstract retellings of someone else's experience (Nisbett and Ross, 1980). Finally, interlock partner information is likely to be seen as relatively trustworthy. Interlock partners are probably not motivated by a great deal of self-interest in the information diffusion process. Interlock partners are prohibited by law from being direct competitors (Zajac, 1988), and the fiduciary role of directors probably motivates them to provide information that will be helpful to the company on whose board they sit.

Information obtained through interlocks, however, is not the only source available to managers. Consultants, accountants, attorneys, the business press, and personal contacts in other firms are all additional potential sources of information. With very few exceptions (see Rogers, 1995, for one), existing literatures on interorganizational information flows do not examine the interaction of multiple information sources. We thus know little about which sources are influential and how their presence affects interlock influence. If one views interlocks as a way to scan the business environment, however, then the presence of other sources of information should affect the influence of the interlock, and the information from some interlock partners should be more influential than the information from other interlock partners. We studied this issue by using a previously established relationship showing that information about acquisitions flows through interlocks (Haunschild, 1993) to investigate the impact of interlocks and other information sources on an important firm decision—whether to acquire another firm.

Interlocks and Acquisitions

Acquisitions were quite popular during the 1980s, the period of the study we report here. The 1980s produced a wave of mergers and acquisitions, where approximately 24,000 firms were acquired in an exchange of $1.3 trillion in assets. Many of the largest firms in the U.S. were acquired during the 1980s, including 25 percent of the Fortune 500. Because they were so popular, acquisitions were likely to be talked about in multiple forums, exposing firm managers to multiple sources of information about acquisitions. Furthermore, anecdotal evidence suggests that directors learn about mergers and acquisitions through their board experiences. One CEO claimed that the "insights one can gain [from sitting on a board] will definitely be of some value when looking at a merger or an LBO" (Lorsch and MacIver, 1989: 27). Haunschild (1993) attempted to distinguish and test three kinds of information about acquisitions that might be transmitted through interlocks: private information, how-to (or procedural) information, and normative information. Private information includes information about potential acquisition partners that is not generally known, i.e., target firms that can be acquired, acquirers that are looking for targets. How-to information includes information that helps an acquirer or target complete the acquisition processes. Examples include which investment bankers to use, how to structure a specific type of deal, or how to respond to an unwanted takeover threat. Chrysler, for example, found the experience of several of its board members with companies that had received or solicited takeover attempts to be a useful source of how-to infor-

mation for dealing with Kirk Kerkorian's takeover attempt (Stern, 1995; see also Davis, 1996).

Normative information consists of information on the normative status of acquisitions in general or specific acquisition techniques. Examples include the idea that acquisitions are the "thing to do" or that firms should acquire others or risk being acquired themselves. Such normative information may result in "acquisition fever," in which firms acquire simply because others are acquiring. As an example of the transmission of normative influence through interlocks, Sterngold (1995) discussed how the once-deviant practice of hostile takeovers has become accepted by directors as a normal corporate strategy (see Davis, 1996). Normative influence from directors may explain why hostile takeovers are now common (cf. Hirsch, 1986).

The type of information transmitted through the interlock is likely to vary according to whether the interlock partners' experience was as an acquirer or a target. Haunschild (1993) studied information transmitted by acquirers to other potential acquirers and tested whether private information about potential targets, how-to information that would help the acquirer complete the acquisition process, or normative information was being transmitted. Results of her tests show little support for the transmission of private information, but how-to and normative information may be transmitted (Haunschild, 1993; see also Davis, Tinsley, and Diekmann, 1995). If interlocks do affect acquisitions by providing normative and/or how-to information, then we should find firms tied to each other through director ties doing similar numbers of acquisitions, and this similarity should occur in a time-ordered fashion. Thus, consistent with Haunschild (1993), there should be a positive relationship between the number of acquisitions completed by firms and the number of acquisitions previously completed by its interlock partners:

Hypothesis 1 (H1): The number of current acquisitions completed by focal firms is positively related to the number of prior acquisitions completed by its interlock partners.

Information Substitution

Because interlock partners are not the only source of information about acquisitions available to directors, it is possible that the greater the number of other sources, the lower the impact of the interlock on acquisitions. Information sources could thus substitute for each other. The information substitution effect is likely to occur for several reasons. First, the likelihood of duplicate information being obtained increases with the number of sources of information accessed. If influence is a function of the number of unique pieces of information obtained, then duplicate information will reduce impact. So if a firm is getting the same information from both an interlock partner and a second source, the impact of the interlock partner will be reduced. Second, multiple sources of information increase the likelihood of information overload and also possibly the likelihood of satisficing—in which sources are searched until a "satisfactory" answer is found (Simon, 1955, 1956)—both of which are likely to reduce the impact of the individual sources. Thus, the impact of the ac-

quisition information obtained from interlock partners should be reduced in the presence of other information sources.

One way to examine the effects of alternate sources of information is to determine which firms are likely to be in a position to have more access to information. First, firm size is likely to be related to information access. Large firms are likely to have access to more information than small firms because they are likely to employ more boundary spanners, individuals responsible for gathering environmental information. Large firms also have the resources necessary to obtain information through other means, such as hiring consultants and attending conferences, and are also more likely to have acquisition professionals (e.g., investment bankers) calling on them with acquisition information.[1] If large firms gather more information, then at least some of this information is likely to involve acquisitions, thus making acquisition information obtained through the interlock less important. Thus, we hypothesize:

Hypothesis 2 (H2): The relationship between the number of current acquisitions by the focal firm and the number of prior acquisitions by its interlock partners will be weaker for large firms.

Second, firms central in interorganizational networks are exposed to more sources of information than firms that are not central (Mariolis and Jones, 1982; Davis, 1991). These sources of information need not be direct. For example, firms may get indirect access by using their interlock partners to put them in touch with other firms or individuals that have information about acquisitions, making use of "weak ties" (Granovetter, 1973). Further, centrality is not just a proxy for size, although they are moderately correlated. Studies have shown centrality effects even when size is included in the model (e.g., Davis, 1991; Haunschild, 1993). Centrality has been shown to be related to the adoption of poison pills (Davis, 1991) and making acquisitions (Haunschild, 1993). If centrality exposes firms to more sources of information, then central firms should be less influenced by the acquisition information of its interlock partners than firms that are not central:

Hypothesis 3 (H3): The relationship between the number of current acquisitions by the focal firm and the number of acquisitions by its interlock partners will be weaker for central firms than for firms that are not central.

A second way of looking at alternate sources of information is to determine the specific sources that firm managers may access. One important alternate source comes from the chief executive officer's (CEO's) membership in the Business Council or Business Roundtable. Both the roundtable and the council have approximately 200 members who are chief executives and former chief executive officers of firms. The Business Council, organized in 1933, facilitates discussion of major public policy issues with leaders in government and other sectors. The Business Roundtable, founded in 1972, lobbies the federal government on business issues. These associations are powerful sources of influence in the business community. For example, roundtable member companies collectively employ 9.5 million U.S. workers, and "no other group can rival the firepower" of the roundtable (Hawthorne, 1992: 83). Peer contact among top executives

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We thank one of the reviewers for this idea.

through these memberships is likely to be an important source of information about business practices. Mizruchi (1992) showed that roundtable membership was influential in that common roundtable membership led to similar campaign contributions among firms. Roundtable and council memberships are also likely to be a source of information about acquisitions. While not created for the purpose of circulating such information, once these contacts are established, they may influence acquisition activities. Similar to interlock partner information, information from contacts on the roundtable/council represents a credible, trustworthy, low-cost way to get information. Such information need not be conveyed at roundtable or council meetings. It seems more likely, in fact, that association memberships such as these put executives in a circle of contacts that provide information more informally, e.g., in social gatherings or more casual conversations. Given that roundtable or council membership represents a potential alternate source of information about acquisitions, then such membership should weaken the impact of acquisition information flowing through the interlock:

Hypothesis 4 (H4): The relationship between the number of current acquisitions by focal firms and the number of prior acquisitions by its interlock partners will be weakened by focal firm membership in the Business Roundtable or Business Council.

The business press offers a second alternate source of information. The business press provides the business community with information, some of which is about mergers and acquisitions. Research has shown the influence of written media. Burns and Wholey (1993) showed that journal articles influenced the adoption of matrix management structures in hospitals, and Dopuch, Holthausen, and Leftwich (1986) found *Wall Street Journal* articles were influential in market reactions to qualified auditor opinions. Written media may also influence mergers and acquisitions. If the business press contains numerous recent reports of acquisitions, then the interlock should become less necessary for acquisition information, and its influence will be reduced. Thus, we expect the relationship between acquisitions by focal firms and prior acquisitions completed by its interlock partners to weaken as recent coverage of acquisitions by the business press increases:

Hypothesis 5 (H5): The relationship between the number of current acquisitions by the focal firm and the number of prior acquisitions by its interlock partners will be weakened by high levels of recent business press coverage of mergers and acquisitions.

Differential Influence

A second way of answering the question of when interlocks matter is to investigate whether all interlock relationships have equal influence or whether some interlocks are more influential than others. One way that influence may vary is by similarity between the interlock partner and the focal firm. Information obtained from similar interlock partners may be more or less influential than information obtained from dissimilar partners. Existing theory suggests that information from similar others will be more influential. Social psychological research has suggested that similar others are better models for social comparison (Festinger, 1954). Neoinstitu-

tional theorists have proposed that under conditions of uncertainty, firms look to similar others and imitate them (DiMaggio and Powell, 1983). Podolny (1994) showed that, under conditions of uncertainty, firms interacted with similar others. While not dealing specifically with interlocks, some empirical work supports the idea that firms attend to the actions of similar others more than dissimilar others. For example, Kraatz (1995) found that colleges are more likely to adopt curriculum changes if similar others have adopted them, and Haveman (1993) found that thrifts followed similar-sized thrifts into new markets. All these findings suggest that information obtained from similar interlock partners is more influential than information obtained from dissimilar interlock partners. Actions of similar partners are more likely to be seen as relevant, both strategically and normatively, than actions of dissimilar partners. When similar interlock partners engage in acquisitions, the focal firm will more likely engage in acquisitions than when dissimilar interlock partners do them. Thus, we hypothesize:

Hypothesis 6 (H6): The relationship between the number of current acquisitions by the focal firm and the number of prior acquisitions by its interlock partners will be stronger for similar partners.

METHOD

We examined firms completing different numbers of acquisitions (including no acquisitions) during the 1981–1990 period. Data on acquisitions came from the Journal of Mergers and Acquisitions (the M&A database), which includes all acquisitions during this period that exceeded a purchase price of one million dollars.

Sample

The sample consisted of all medium and large-sized firms (more than $35 million in assets) listed in the 1981–1990 COMPUSTAT databases for four industries. We did not study small firms because they make very few acquisitions and have very few interlocks. Because we used COMPUSTAT historical files, firms acquired by other firms during the 1981–1990 period were included—the sample was not restricted to survivors. We restricted the focal firms sampled to four industries, because acquisition activity varies by industry, and controlled for industry in all analyses. Having a few firms in many industries would restrict controlling for industry differences. The four Standard Industry Classification (SIC) industries selected were electrical equipment manufacturing (SIC 36), transportation equipment (SIC 37), wholesale trade (SIC 50), and business services (SIC 73). We chose the electrical and transportation equipment industries because manufacturing industries like these have been the subject of most of the acquisition research to date (e.g., Golbe and White, 1988; Fowler and Schmidt, 1988; Davis, Diekmann, and Tinsley, 1994). We chose the wholesale and business services industries because they were important, growing industries during the 1980s. Selecting all medium and large-sized firms (more than $35 million in assets) from these four industries resulted in a sample of 327 focal firms. These 327 focal firms were tied to 4,633 other firms, so data were collected on a total of 4,960 firms. We did not collect data for all ten years during this 1981–1990 period.

Rather, for each focal firm, we randomly selected one year from the 1981–1990 period and collected acquisition data for the selected year and the three years before the selected year. This sampling approach minimized data collection while still providing variance across firms. We used the three-year period because it has been shown in past research that interlock partners' actions are influential for three years (Haunschild, 1993, 1994).

Dependent Variable

The dependent variable, the number of acquisitions completed by the focal firm during the sampled year, came from the M&A database and ranged from zero to nine. We restricted our sample to "traditional" acquisitions, in which one existing firm buys a controlling interest in another existing firm, as other types of acquisitions (e.g., LBOs) may not necessarily to be subject to the same types of influence. Further, the purchase price of the acquisition had to exceed one million dollars to be included in the database.

Independent Variables

Acquisitions by interlock partners. We collected data on the acquisitions by interlock partners for this study by obtaining directorship lists from the proxy statements of the focal firm. Directors can be inside or outside directors. Executives who sit on the board of their own companies are considered inside directors; when an inside director sits on the board of another company, this is called a sent tie. Outside directors create received ties from the firm with which they are principally affiliated. Outside directors also create neutral ties from those firms on whose boards they sit (but with whom they are not principally affiliated), to the focal firm.

Inside directors sitting on a board of another company may learn about acquisitions and the process of acquisitions from that company. These sent ties are likely to influence acquisitions because these executives set the strategic direction of their own firms. Outside directors of a firm may also use their knowledge from other board experiences, but these received ties are likely to be more indirectly influential, as these directors do not directly set the strategic direction of the firm. Neutral ties are probably the least likely ties to influence acquisition decisions, because they represent an outside director discussing information about another firm of which he or she is not an officer. Fiduciary responsibility probably discourages such discussions, except in very general terms. Two studies, however, have shown that neutral ties influence firm activities. Palmer et al. (1995) found that the number of industrial neutral ties weakly predicted a lower likelihood of friendly acquisition, and Palmer, Jennings, and Zhou (1993) found neutral ties to be influential in predicting adoption of the M-form.

Although Haunschild (1993) studied only sent interlocks, we decided for this study to allow for the possibility that all types of interlocks are influential in acquisition decisions and collected data on sent, received, and neutral interlocks. There were 622 sent interlocks, 856 received interlocks, and 3,155 neutral interlocks. Interlock partners were then checked against the M&A database. We used the number of

acquisitions by the interlock partners for the sample year and three years before the sampled year to create the interlocked firm acquisition variables.

Firm size. Size was measured by the sales of the focal firm at the end of the year prior to the sampled year. Since the sales variable was highly skewed, we used a log transformation to correct for skew before entering size into the analyses. We also ran analyses with sales untransformed, and while overall model fit was slightly worse, the significance of individual coefficients did not change. In addition, we created a variable reflecting the interaction of size with the number of acquisitions by the interlocked firms and tried other size measures: assets, number of employees, and total equity. The significance of the main effects varied somewhat when these other measures were used, but, except for number of employees, the interaction was always negative and significant. Sales seemed to provide the best overall model fit and, of the three variables, was least correlated with other measures like centrality. We therefore chose to follow prior research (e.g., Davis, 1991) and use sales as our size measure.[2]

Network centrality. While different measures of centrality have been used in different studies, we chose to use simple degree centrality (the number of interlock ties to other firms) because it best captures the number of information sources available to a firm. Other centrality measures include betweenness and closeness (Wasserman and Faust, 1994). Betweenness centrality is used as a measure of power or influence because two actors wishing to interact must go to other actors between them, thus these other actors have high betweenness centrality. Closeness measures how quickly actors can communicate with all others in a network. Our theory suggests that it is the number of information sources that is important, not the speed of information transfer or degree of power. The simplest measure of centrality, degree centrality, is thus best suited for our theory. We follow other studies (Davis, 1991; Mizruchi, 1992; Haunschild, 1993) in using this centrality measure.

Network degree centrality was calculated as the number of sent ties, minus any duplicated ties, i.e., when two directors from the focal firm sit on the same outside board. These sent ties captured the number of other firms the focal firm's inside directors could get information from through board ties. This measure is also called outdegree centrality. Indegree centrality (the number of outside directors that sit on the focal firm's board) could also plausibly be related to information access but was not significantly related to acquisitions in this study. We also created a variable reflecting the interaction of centrality with the number of acquisitions by the interlocked firms.

CEO membership in Business Council or Business Roundtable. We created a variable coded one if the CEO of the focal firm was a member of the Business Council and/or Business Roundtable and zero otherwise. Business Council membership was obtained from membership lists for four years during the 1980–1990 period. For those firms sampled during the 1986–1990 period, we used a 1989 Business

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Results for other size variables are available from the authors.

Roundtable membership listing. For those firms sampled during the 1981–1985 period, we used a 1983 listing. Other listings were not available, but the correlation between membership on the 1983 listing and the 1989 listing was .73, so membership is fairly stable. Even though membership in the roundtable is skewed toward large firms, the correlation between size and membership is only .36, so collinearity should not be a problem. Fourteen percent of the CEOs in our sampled companies were members of either the Business Council or Business Roundtable, and 2 percent were members of both. We then created a variable reflecting the interaction between the acquisitions of the interlock partners and focal CEO membership in the Business Council or Business Roundtable.

Business press articles. The *Wall Street Journal, Business Week, Fortune,* and *Forbes* all contain information about acquisitions. The *Wall Street Journal,* being a daily newspaper, tends to report abbreviated descriptions of all major acquisitions that occur. These short articles report only the basic features of the acquisition, e.g., the acquirer, the target, and the price paid. The weekly and monthly journals (e.g., *Business Week*) do not cover all acquisitions but generally have richer information about the ones they cover. These articles typically include an evaluation of the motivations and likely outcomes of the transaction. These longer articles probably have more influence and give directors more information than the mere accounting of acquisitions. In support of this idea, the correlation between acquisitions by all firms and the number of articles about acquisitions in the *Wall Street Journal* was .864, whereas it was only .538 with the number of articles in *Business Week, Fortune,* and *Forbes.* Thus, we expected the combined number of *Business Week, Fortune,* and *Forbes* articles to represent the amount of relevant business press information about acquisitions available to directors. Not using *Wall Street Journal* articles also helped rule out the possibility that business press articles were just a proxy for the number of acquisitions being completed in a given period. We discussed the business press articles as a cause of acquisitions, but they are also an effect of acquisitions: the more acquisitions occurring, the more business press articles are written about acquisitions. Besides not using *Wall Street Journal* articles, we controlled for this possibility by including the number of acquisitions completed by all firms in the prior three years as a control variable in all analyses. We obtained business press articles from periodical indexes and created a variable for the combined number of articles dealing with mergers and acquisitions in the above-named sources during the three years prior to the sampled year for each firm. A variable was then created reflecting the interaction of the number of acquisitions by interlock partners and the number of business press articles.

Similarity. One measure of similarity is the primary industry in which the firm does business. Both focal firms and interlock partners were classified according to 2-digit SIC codes. We created a variable that reflected the degree of similarity between the focal firm and its interlock partners, for which higher values indicated more similarity. We constructed the similarity variable as follows: firms sharing the same 2-digit

SIC code, being the most similar, were coded four; firms sharing the same 1-digit but not the same 2-digit SIC were coded three; firms were coded two when they did not share the same 1- or 2-digit SIC but shared the same general SIC category of manufacturing and mining (SIC 0–50), wholesaling (SIC 50–59), or service (SIC 60–99); and if the focal firms and interlock partners shared none of these industry similarities, the variable was coded one. A variable was then created reflecting the interaction of the acquisitions by interlock partners and industry similarity. We also conducted analyses running the number of acquisitions by interlock partners in each of the four similarity classes in separate models and then compared the coefficients on the similarity variable across models.

Other Control Variables

One possible alternative explanation for a negative interaction between size, centrality, and association membership with the number of acquisitions by interlock partners is firm status. According to this argument, high-status firms, because they are high status (but not because they have more information), paid less attention to the information obtained from its interlock partners than low-status firms. It seems somewhat unlikely that a status effect could be partialled out into effects that produce independent negative interactions, whereas information—because it takes different forms (information from internal resources, information from centrality, information from association partners)—can produce such effects. We decided, however, to control for this possibility by measuring the status of each focal firm through the centrality of each focal firm's outside directors. High-status firms are likely to be associated with directors that are central in interlock networks. We used the number of ties of the focal firm's outside directors (the number of neutral interlocks) as our status measure, which is analogous to status measures used in other studies (e.g., Podolny and Stuart, 1995). Neutral interlocks capture the centrality of outside directors, and central outside directors are likely to increase the status of the focal firm. Thus, we used the number of outside boards on which the focal firm's directors sit (sent ties) as our measure of centrality and the number of boards on which the focal firm's outside directors sit (neutral ties) as our measure of status.

A review of the literature on acquisitions suggested yet other variables that may influence the number of acquisitions by focal firms, including the number of previous acquisitions by the focal firm, the year of the acquisition, the industry of the focal firm, and the financial condition of the focal firm. The probability of a firm engaging in an acquisition in one year is likely to be related to acquisitions by that firm in previous years. Some firms may embark on acquisition programs, completing several acquisitions in a short period of time. Others may find an acquisition a significant drain on resources, thus lessening the likelihood of completing another acquisition if they just did one. To control for firm-level tendencies to acquire or not acquire, independent of information flowing through interlocks and other sources, we used the number of acquisitions by the focal firm during the prior three years as a control variable. Including this type of

lagged dependent variable also provided a good control for unobserved heterogeneity (Heckman and Borjas, 1980).

Several theories of acquisitions have proposed that industry conditions affect acquisition activities (Pfeffer and Salancik, 1978; Jensen, 1987). To control for these effects, we entered the 2-digit SIC industry of the focal firm into the model as a control variable. To see whether 2-digit rather than 4-digit codes were sufficient, we also reestimated the basic models using 4-digit SIC codes for the electrical equipment industry (SIC 36). The significance of the hypothesized results did not change in these models, so we used 2-digit SIC codes in all reported analyses. Several theories have also predicted that acquisition activity will vary by year. Macroeconomic researchers, for example, have suggested that macroeconomic variables like GNP will be associated with levels of acquisition activity (e.g., Becketti, 1986), although the relationship between macroeconomic conditions and acquisition activity appeared to break down in the 1980s (Golbe and White, 1988). To control for any such effects, however, we entered year (1980–1990) as a set of dummy variables into the model.

Finally, four financial variables that have been proposed or found to be related to acquisition activity were included as controls. These included two measures of the acquiring firm's free cash flow and two measures of performance. All financial variables were obtained from COMPUSTAT. According to Jensen's (1987) free cash flow theory, high cash flow and low debt create incentives for managers to engage in projects related to firm growth, rather than pay the free cash back to shareholders. Thus, we might expect free cash flow, i.e., high levels of current free cash and low debt, to be related to the number of acquisitions (especially unrelated acquisitions) by the focal firms. Consistent with Lehn and Poulsen (1989), we measured free cash flow as follows: FCF = (Operating Income – Taxes – Interest Expense – Preferred Dividend – Common Dividend)/Equity. We measured free cash flow at the end of the year before the sampled year. The second measure of free cash flow was the firm's debt-to-equity ratio. Low debt in relation to equity means the firm has more free cash flow, and more acquisitions may result. We therefore included the debt/equity ratio as a control variable, again measured at the end of the year before the sampled year.

Firm performance is likely to influence the number of acquisitions, but whether positively or negatively is unclear. Good prior performance may result in acquisitions because of managerial hubris (Roll, 1986) or because acquisition financing is easier and cheaper with good performance. Morck, Shleifer, and Vishny (1990), however, hypothesized that managers in poorly performing firms had incentives to try something new and thus bought new businesses that they may be better at running than their current businesses. If this is true, then we may see more acquisitions by poorly performing firms. We therefore controlled for prior performance by using two measures of firm performance. Following other studies, we used firm performance relative to industry, subtracting the mean performance measure of all firms in the same 2-digit industry from the individual firm's

performance. The first performance measure was income growth over the three years prior to the sampled year. Following Morck, Shleifer, and Vishny (1990), we measured income growth as the log of the difference between income in the year before the acquisition and four years before the acquisition, standardized by industry. The second performance measure was return on assets during the three years prior to the sampled year. Return on assets was measured as {earnings before extraordinary items/[(assets – liabilities and stockholders equity) + depreciation and amortization]}. With use of all the above control variables, our results should be net of any economic, resource dependence, or status explanations for acquisition activity.

RESULTS

Table 1 presents descriptive statistics and correlations among the key study variables.

Given that our dependent measure was a count variable (the number of acquisitions completed by the focal firm), OLS regression is inappropriate. We considered using Poisson regression, which is specifically designed for count dependent variables (Greene, 1993), but Poisson regression assumes that the mean and variance of the event counts are equal. When the variance is greater than the mean, the variable is considered to be overdispersed. Overdispersion can occur as a result of contagion, unobserved heterogeneity, or time-dependence (Barron, 1992). The negative binomial model specifically corrects for overdispersion and has been used in other studies of overdispersed counts (Ingram and Inman, 1996; Barnett, 1997). Because we model contagion processes, we used the negative binomial regression, estimating the models with the LIMDEP statistical package. Our negative binomial models use a quadratic parameterization of the variance-to-mean ratio and a gamma-distributed disturbance to model overdispersion (Greene, 1992). The negative binomial model is log-linear, so exponentiating a coefficient gives the estimated multiplier effect that a one-unit change in the covariate has on the expected number of acquisitions. The inclusion of the lagged dependent variables means that the effects should be interpreted as the change in the expected number (Liao, 1994). Models excluding the lagged dependent variable were also run, and the significance of the hypothesized relationships did not vary in these models.

Since table 1 shows some relatively high correlations, we took several steps to investigate whether multicollinearity was affecting the results. Some of the high correlations are between main effects and interactions. In these cases, we centered the main effects prior to calculating the interaction, a procedure suggested by Cronbach (1987) and Jaccard, Turrisi, and Wan (1990). Second, all models were run with highly correlated variables entered individually, and likelihood ratio tests are reported across models. Since multicollinearity does not affect model fit, likelihood ratio tests indicate whether the addition of a single variable into a model is significant.

Table 2 presents the results of the basic analyses (H1) and the size (H2) and centrality (H3) analyses. The results of

Table 1

Descriptive Statistics and Correlations among Key Study Variables*

Variable	Mean	S.D.	Min.	Max.	1	2	3	4	5	6
1. No. current acqsns. by focal firm	.662	1.21	0	9						
2. Acqsns. by interlock ptnrs. prior 3 yrs.	3.39	6.60	0	50	.460					
3. (Log) focal firm size	6.64	1.43	3.42	12	.321	.293				
4. Focal firm centrality	2.12	2.57	0	15	.261	.544	.242			
5. Association member? (1 = yes)	.155	.362	0	1	.263	.396	.356	.315		
6. No. business press articles prior 3 yrs.	2787	341	2363	3287	.116	.004	.007	−.150	−.034	
7. Acqsns. by ptnrs. in same 2-digit SIC	.295	1.20	0	10	.369	.754	.345	.529	.404	−.017
8. Acqsns. by ptnrs. in same 1-digit SIC	.702	2.02	0	14	.345	.773	.306	.408	.335	−.009
9. Acqsns. by ptnrs. in same general cat.	.685	2.69	0	29	.263	.684	.311	.436	.224	−.062
10. Acqsns. by dissimilar partners	2.05	4.71	0	32	.088	.281	.070	.232	−.004	.021
11. Similarity	1.09	1.15	1	4	.135	.196	.154	.387	.080	−.022
12. Acqsns. by ptnrs. × focal size	.459	5.33	−.273	78.8	−.347	.342	.312	.028	.207	.097
13. Acqsns. by ptnrs. × focal centrality	.521	2.07	−1.96	26.1	−.137	.424	.140	.514	.268	−.061
14. Acqsns. by ptnrs. × association member	.398	1.83	−1.53	16.0	−.345	.572	.332	.351	.356	.036
15. Acqsns. by ptnrs. × business press articles	.333	8.91	34.9	83.6	.240	.183	.133	−.195	.039	.138
16. Acqsns. by ptnrs. × partner similarity	4.57	20.9	−33.7	165	.187	.218	.132	.104	.080	.053
17. SIC, 36—electrical equipment	.328	.470	0	1	−.175	−.058	−.178	.010	−.213	−.007
18. SIC, 37—transportation	.158	.365	0	1	.115	.319	.223	.171	.215	.030
19. SIC, 50—wholesaling	.280	.450	0	1	.017	−.128	−.126	−.044	.162	.047
20. SIC, 73—business services	.234	.424	0	1	.077	−.064	−.126	−.106	−.121	−.073
21. Focal firm free cash flow	11.8	54.9	−2.99	365.5	.048	.058	.029	−.055	.100	−.017
22. Focal firm return on assets	.098	.630	−2.31	5.38	.147	.129	.392	.063	.299	.040
23. Focal firm income growth	−.268	1.04	−7.08	5.03	.037	−.074	.009	.022	.014	.097
24. Focal firm debt/equity	.546	.680	0	6.81	.077	−.043	−.018	−.027	−.126	.056
25. Acqsns. by focal firm prior 3 yrs.	1.30	2.11	0	16	.589	.437	.281	.156	.136	.132
26. Acqsns. by all firms prior 3 yrs.	2582	632	1237	3541	.111	.043	−.005	−.103	−.097	.538
27. Focal firm status	9.74	9.61	0	53	.118	.504	.379	.493	.365	−.049

Variable	7	8	9	10	11	12	13	14	15	16
8. Acqsns. by ptnrs. in same 1-digit SIC	.501									
9. Acqsns. by ptnrs. in same general cat.	.340	.511								
10. Acqsns. by dissimilar partners	.074	.072	.185							
11. Similarity	.100	.119	.194	.325						
12. Acqsns. by ptnrs. × focal size	.299	.521	.478	−.024	.061					
13. Acqsns. by ptnrs. × focal centrality	.515	.729	.435	.131	−.031	.061				
14. Acqsns. by ptnrs. × association member	.630	.780	.521	−.053	.067	.645	.537			
15. Acqsns. by ptnrs. × business press articles	.115	.082	.044	−.082	.013	.609	.609	.229		
16. Acqsns. by ptnrs. × partner similarity	.070	.002	.079	.515	.440	.320	−.094	.115	.497	
17. SIC, 36—electrical equipment	−.149	−.211	.126	−.015	.030	−.062	.009	−.064	−.090	−.046
18. SIC, 37—transportation	.241	.269	.283	.098	.219	.222	.164	.339	.054	.194
19. SIC, 50—wholesaling	−.010	−.164	−.174	.013	−.165	−.061	−.064	−.117	.022	−.046
20. SIC, 73—business services	−.026	−.024	−.186	−.080	−.037	−.052	−.078	−.088	.030	−.061
21. Focal firm free cash flow	.039	.016	−.063	−.055	−.017	−.022	−.064	−.059	.058	−.024
22. Focal firm return on assets	.116	.178	.145	.008	.106	.648	.181	.209	.221	.055
23. Focal firm income growth	−.057	−.072	−.034	−.026	−.073	.017	−.048	−.028	−.054	−.058
24. Focal firm debt/equity	−.051	−.041	−.087	−.005	.015	−.026	−.067	−.060	−.069	−.074
25. Acqsns. by focal firm prior 3 yrs.	.271	.319	.297	.128	.095	.247	.106	.261	.240	.252
26. Acqsns. by all firms prior 3 yrs.	.037	.045	.069	.071	.026	.060	−.016	.064	−.131	.032
27. Focal firm status	.427	.356	.351	.164	.245	.114	.330	.359	−.053	.157

Variable	17	18	19	20	21	22	23	24	25	26
18. SIC, 37—transportation	−.284									
19. SIC, 50—wholesaling	−.445	−.270								
20. SIC, 73—business services	−.381	−.231	−.368							
21. Focal firm free cash flow	−.077	−.073	−.058	.225						
22. Focal firm return on assets	−.050	.279	−.112	−.057	.004					
23. Focal firm income growth	−.052	.078	−.006	−.116	−.131	.011				
24. Focal firm debt/equity	−.087	−.043	.086	.038	.138	−.048	.037			
25. Acqsns. by focal firm prior 3 yrs.	−.095	.135	.035	.030	−.015	.333	.029	.037		
26. Acqsns. by all firms prior 3 yrs.	−.017	.070	.013	−.053	.092	.020	.130	.077	.170	
27. Focal firm status	.156	−.006	.287	−.117	.106	.021	.241	.088	−.018	.145

* Correlations greater than .11 are significant at the .05 level.

model 1, which represents the basic analyses of the control variables and their effect on the number of acquisitions completed by the focal firm, show that several of the control variables are statistically significant. The number of prior acquisitions completed by the focal firms is related to the number of current acquisitions, and higher-status firms did more acquisitions. There were more acquisitions during 1986 and 1987 than 1981, and fewer in SIC 36 (electrical equipment manufacturing) than SIC 73 (business services).

In model 2, we add the effect of the number of acquisitions completed by the focal firms' interlock partners. Consistent with H1, model 2 shows that the number of acquisitions completed by interlock partners in the prior three years is positively related to the number of acquisitions completed by the focal firm in the current year. We ran separate analyses for the number of acquisitions completed by those firms on which inside directors of the focal firm sat (sent ties), the number of acquisitions completed by those firms for which outside directors of the focal firm were principally affiliated (received ties), and the number of acquisitions completed by those firms with which outside directors were not principally affiliated but on whose boards they sat (neutral ties). We found that the sent ties and received ties were influential: both the number of acquisitions completed by interlock partners of inside directors and completed by firms that outside directors were affiliated with were related to the number of acquisitions completed by the focal firms. Neutral ties were not influential. This is consistent with our arguments that sent and received ties, because they involve direct experience and affiliation, are more likely to be influential than neutral ties (see also Mizruchi, 1982). Given these results, we combined the sent and received tie acquisitions into a single variable. The results of the likelihood-ratio test (model 2 vs. model 1) show that the addition of the number of acquisitions by the interlock partners adds significantly to model fit.

Size and Centrality Results

Model 3 of table 2 adds the main effect of firm size. Larger firms did more acquisitions. This may be due to the fact that large firms have more information resources, as this effect is independent of status, resource dependence, and the financial resources of the firm. Our hypothesis, however, is not about the main effect of size but about the interaction of size with acquisitions by interlock partners. In model 4, therefore, we add the interaction of firm size and the number of acquisitions by the firm's interlock partners. Model 4 shows that, as predicted by H2, firm size decreases the impact of the interlock. The interaction between the number of prior acquisitions by interlock partners and focal firm size is negative. Thus, interlock information was less influential for large firms than small firms, reducing the number of acquisitions by approximately 14 percent [exp(−.154) = .857]. This supports the idea that large firms, because they have more access to information than small firms, are less influenced by the acquisitions of their interlock partners. For illustrative purposes, we did a median split on the size and acquisitions by interlock partners variables. Large firms whose interlock partners did many acquisitions completed 3.82 acquisitions, and they completed 2.67 acquisitions when their interlock

Table 2

Negative Binomial Regression Analysis of Number of Acquisitions Completed by the Focal Firms (N = 327)*

Variable	Model (1)	(2)	(3)	(4)	(5)	(6)	(7)
N acquisitions by interlock partners (Yr. 1 . . . Yr. 3)		.033**	.034**	.035**	.026**	.031*	.035**
		(.010)	(.010)	(.010)	(.011)	(.014)	(.015)
(Log) focal firm size			.056**	.101**			.100
			(.005)	(.012)			(.082)
Focal firm size × N Acqsns. by interlock partners				−.154*			−.157*
				(.063)			(.063)
Focal firm centrality (N sent ties)					.133**	.151**	.146**
					(.029)	(.030)	(.031)
Focal firm centrality × N Acqsns. by interlock partners						−.058*	−.063*
						(.030)	(.032)
Control variables							
Year 1982	−.076	−.076	−.133	−.119	.143	.173	.054
	(.454)	(.455)	(.508)	(.508)	(.462)	(.462)	(.508)
Year 1983	−.756	−.129	−.244	−.192	.295	.402	.160
	(.588)	(.589)	(.748)	(.745)	(.602)	(.607)	(.750)
Year 1984	.118	.022	−.045	−.094	.010	.103	−.044
	(.452)	(.453)	(.528)	(.527)	(.455)	(.458)	(.522)
Year 1985	.560	.135	.104	.019	.530	.678	.396
	(.567)	(.591)	(.890)	(.790)	(.602)	(.608)	(.786)
Year 1986	1.45*	1.20*	1.06	1.16	1.59*	1.68**	1.40
	(.607)	(.611)	(.832)	(.835)	(.629)	(.635)	(.833)
Year 1987	1.81*	1.63*	1.45	1.53	2.19*	2.34**	1.98*
	(.714)	(.717)	(.984)	(.985)	(.741)	(.750)	(.990)
Year 1988	.107	−.054	−.204	−.185	.413	.562	.230
	(.686)	(.068)	(.913)	(.916)	(.711)	(.719)	(.923)
Year 1989	.324	.227	.097	.152	.587	.734	.460
	(.784)	(.785)	(.600)	(.609)	(.042)	(.589)	(.787)
Year 1990	−.035	−.090	−.193	.018	.382	.414	.250
	(.577)	(.574)	(.705)	(.709)	(.579)	(.583)	(.710)
SIC 36	−.535*	−.556**	−.551**	−.533*	−.626**	−.631**	−.603**
	(.210)	(.210)	(.211)	(.212)	(.212)	(.213)	(.215)
SIC 37	−.194	−.257	−.242	−.233	−.261	−.275	−.232
	(.238)	(.243)	(.250)	(.248)	(.237)	(.236)	(.240)
SIC 50	−.159	−.248	−.247	−.232	−.255	−.281	−.273
	(.184)	(.190)	(.190)	(.190)	(.190)	(.191)	(.193)
Free cash flow	−.114E-2	−.147E-3	−.144E-2	−.161E-2	−.488E-3	−.882E-3	−.101E-2
	(.114E-2)	(.114E-2)	(.114E-2)	(.114E-2)	(.116E-2)	(.119E-2)	(.120E-2)
Return on assets	−.014	−.142	−.012	.122	.014	.003	.065
	(.019)	(.022)	(.023)	(.071)	(.021)	(.023)	(.075)
Income growth	.185E-3	.338E-3	.343E-3	.266E-3	.216E-3	.248E-3	.233E-3
	(.205E-3)	(.212E-3)	(.214E-3)	(.216E-3)	(.212E-3)	(.213E-3)	(.218E-3)
Debt/equity	.293**	.288**	.292**	.293**	.290**	.289**	.298**
	(.087)	(.088)	(.089)	(.090)	(.090)	(.090)	(.092)
N Prior acquisitions by focal firm (Yr. 1 . . . Yr. 3)	.217**	.183**	.185**	.196**	.177**	.161**	.170**
	(.024)	(.026)	(.028)	(.028)	(.026)	(.027)	(.030)
N Acquisitions by all firms (Yr. 1 . . .Yr. 3)	−.575E-3*	−.476E-3*	−.398E-3	−.430E-3	−.538E-3	−.699E-3**	−.527E-3
	(.215E-3)	(.216E-3)	(.381E-3)	(.383E-3)	(.381E-3)	(.228E-3)	(.382E-3)
Focal firm status (N neutral ties)	.165**	.063**	.007	.004	.009	.008	.062**
	(.007)	(.008)	(.009)	(.009)	(.008)	(.009)	(.010)
α	.334	.333	.333	.308	.028	.038	.081
	(.203)	(.191)	(.192)	(.182)	(.118)	(.125)	(.141)
−2 Log likelihood	630.24	619.86	610.24	605.86	599.44	595.40	576.02
D.f.	18	19	20	21	20	21	23
Chi-square against previous model		10.38**	9.62**	4.38*	20.42**†	4.04*	19.38**
D.f.		1	1	1	1	1	2

* $p < .05$; ** $p < .01$; two-tailed tests.
* Unstandardized coefficients are reported. Standard errors are in parentheses.
† Chi-square is against model 2.

partners did few acquisitions. Small firms completed 2.13 acquisitions when their interlock partners did many acquisitions but only completed .29 acquisitions when their interlock partners did few acquisitions. The impact of acquisitions completed by interlock partners was greater on small firms than large firms, supporting the idea that large firms are less affected by interlock information.

The addition of size to these models makes the status effect nonsignificant, probably because of multicollinearity, as size, status, and number of acquisitions by interlock partners are all relatively highly correlated. Since status is a control variable, we left status in the models so that the size effect and the size interactions were net of status effects. The significance of the hypothesized effects do not change in models that do not include the status control variable (results available from the authors).

Model 5 adds the main effect of firm centrality. Central firms completed more acquisitions than noncentral firms. In model 6, we add the interaction of firm centrality and the number of acquisitions by the firm's interlock partners. Model 6 shows that, as predicted, firm centrality decreases the impact of the interlock. The interaction between the number of prior acquisitions by interlock partners and focal firm centrality is negative, showing that interlock information is less influential for central firms than for noncentral firms. In model 7, we ran the centrality and size main effects and interactions in the same model. Size becomes nonsignificant in this model, possibly due to the relatively high correlations among size, centrality, and the interactions of size with number of acquisitions by interlock partners. The size interaction, however, is always negative and significant, even when centrality is in the model. All other results hold in model 7, and model fit improves significantly over all other models.

Association and Business Press Results

Table 3 presents results of the association (H4) and business press (H5) analyses. Model 1 includes the main effects of number of acquisitions by interlock partners, focal firm size, and focal firm centrality. Models 2 and 3 examine whether CEO membership in the Business Council or Business Roundtable affects the influence of the interlock found in model 1. In model 2, we enter the main effect of council or roundtable membership. Model 3 adds the interaction between membership and acquisitions by the interlock partners. As predicted by H4, CEO membership in the council or roundtable weakened the effect of the interlock. The interaction between the number of prior acquisitions by the interlock partners and CEO membership in the council or roundtable is negative and adds significant explanatory power to the model, even with size included. Thus, interlock information is less influential for firms whose CEOs are members of the roundtable/council. This effect holds when we run council and roundtable as separate interaction variables: council and roundtable membership each independently reduced the impact of the interlock.

Models 4 and 5 examine whether the number of business press articles affects the influence of the interlock found in model 1 (H5). Because the number of articles is collinear with year (article counts vary by year), models with both articles and the year dummy variables could not be estimated. We therefore dropped the year dummy variables for these analyses. The number of acquisitions completed by all firms during the prior three years was still used as a control variable, so the business press effect should not be merely a reflection of the fact that articles are associated with acquisi-

Table 3

Negative Binomial Regression Analysis of Number of Acquisitions Completed by the Focal Firms ($N = 327$)*

	Model						
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
N Acquisitions by interlock partners (Yr. 1 . . . Yr. 3)	.027** (.011)	.022** (.010)	.046** (.016)	.021** (.009)	.034** (.015)	.029* (.014)	.050** (.015)
(Log) Focal firm size	.111** (.014)	.100 (.083)	.095 (.086)	.146** (.055)	.145** (.056)	.112 (.075)	.149 (.080)
Focal firm centrality	.134** (.029)	.137** (.029)	.121** (.030)	.117** (.026)	.123** (.039)	.126** (.026)	.109** (.027)
Association membership		.214 (.221)	.243 (.238)				.267 (.223)
Association membership × *N* acquisitions by interlock partners			−.110* (.047)				−.120* (.047)
Business press articles					.653E-3* (.279E-3)	.619E-3* (.276E-3)	.640E-3* (.281E-3)
Business press articles × *N* acquisitions by interlock partners						.017* (.007)	.016* (.007)
Control variables							
Year 1982	.063 (.509)	.088 (.509)	.028 (.506)				
Year 1983	.127 (.750)	.165 (.749)	.142 (.748)				
Year 1984	−.087 (.523)	−.070 (.523)	−.112 (.523)				
Year 1985	.338 (.789)	.363 (.788)	.408 (.780)				
Year 1986	1.38 (.830)	1.42 (.830)	1.30 (.829)				
Year 1987	1.94* (.989)	2.03* (.990)	1.87* (.989)				
Year 1988	.193 (.920)	.253 (.922)	.077 (.925)				
Year 1989	.396 (.786)	.411 (.784)	.318 (.785)				
Year 1990	.231 (.704)	.278 (.704)	.206 (.703)				
SIC 36	−.617** (.213)	−.649** (.217)	−.655** (.219)	−.830** (.203)	−.795** (.298)	−.785** (.208)	−.802** (.213)
SIC 37	−.240 (.244)	−.229 (.244)	−.260 (.245)	−.316 (.223)	−.350 (.267)	−.342 (.239)	−.367 (.240)
SIC 50	−.255 (.190)	−.224 (.192)	−.221 (.197)	−.418** (.180)	−.239 (.244)	−.394* (.188)	−.367* (.190)
Free cash flow	.488E-3 (.116E-2)	.624E-3 (.117E-2)	.139E-3 (.122E-2)	.189E-3 (.114E-2)	−.542E-3 (.181E-2)	−.267E-3 (.115E-2)	−.860E-3 (.119E-2)
Return on assets	−.017 (.023)	−.016 (.023)	.038 (.025)	.006 (.019)	.001 (.019)	−.049 (.027)	−.097 (.031)
Income growth	.216E-3 (.211E-3)	.259E-3 (.213E-3)	.235E-3 (.212E-3)	.227E-3 (.210E-3)	.191E-3 (.211E-3)	.130E-3 (.210E-3)	.147E-3 (.209E-3)
Debt/equity	.295** (.090)	.291** (.092)	.300** (.092)	.179* (.091)	.187* (.090)	.171* (.091)	.191* (.090)
N Prior acquisitions by focal firm (Yr. 1 . . . Yr. 3)	.180** (.027)	.179** (.027)	.173** (.027)	.197** (.024)	.184** (.024)	.182** (.024)	.177** (.024)
N Acquisitions by all firms (Yr. 1 . . . Yr. 3)	−.538E-3** (.381E-3)	−.587E-3** (.383E-3)	−.499E-3 (.386E-3)	.156E-4 (.101E-3	−.458E-3* (.218E-3)	.390E-3 (.216E-3)	−.465E-3* (.221E-3)
Focal firm status	.007 (.009)	.008 (.010)	.009 (.009)	.005 (.009)	.009 (.009)	.011 (.009)	.011 (.010)
α	.026 (.119)	.013 (.116)	.100 (.158)	.571 (.207)	.530 (.205)	.467 (.206)	.394 (.209)
−2 Log likelihood	599.30	598.30	592.80	655.04	649.38	643.40	637.00
D.f.	22	23	24	13	14	15	17
Chi-square against previous model		1.00 1	5.50* 1		5.66* 1	5.98* 1	6.40* 2

$^{*}p < .05$; $^{**}p < .01$; two-tailed tests.
* Unstandardized coefficients are reported. Standard errors are in parentheses.

tions. Model 4 includes the control variables (excluding the year dummy variables), the number of acquisitions by interlock partners, firm size, and firm centrality. Model 5, which adds the main effect of business press articles, shows that

the number of business press articles from the prior three years is positively related to the number of acquisitions by the focal firm in the current year. Model 6 includes the interaction between business press articles and acquisitions by interlock partners. We had predicted that the number of articles would weaken the influence of the interlock (H5). Instead, the number of articles strengthened its impact. The interaction between the number of business press articles in the prior three years and the number of acquisitions by the interlock partners is positive and significant, which means that interlock information is more influential during periods of large amounts of business press coverage of acquisitions.

The fact that we obtained business press effects net of the number of acquisitions by all firms means that business press articles are not simply a proxy for the number of acquisitions by all firms. This helps rule out the possibility that something besides information contained in business press articles caused both acquisitions by all firms and acquisitions by focal firms. To further exclude the possibility that business press articles are a proxy for something other than information about acquisitions (e.g., some annual change in macroeconomic conditions), we also ran models in which we entered the number of business press articles published during the current year in the analysis. Since information takes time to build and to affect acquisitions, some period has to elapse between the publication of the business press articles and their effect on acquisitions. Although announcements of decisions to acquire may be made relatively quickly, the time to complete an acquisition is much longer. Because we examined completed acquisitions, business press articles published in the same year as the focal firm's acquisition should not affect acquisitions or the impact of the interlock on acquisitions. Results of these models (available from the authors) showed that business press articles in the current year do not affect acquisitions or the impact of the interlock on acquisitions, thereby making it more likely that the information contained in the articles is increasing the influence of the number of acquisitions by interlock partners. These results also help rule out the possibility that, since we cannot enter year dummy variables into this analysis, some factor related to macroeconomic conditions was affecting both acquisitions by the focal firms and business press articles.

Model 7 includes both association membership and business press main effects and interactions, and results hold in this model. We also ran models with different combinations of the four interactions (size, centrality, association membership, and business press). As shown in table 2, both size and centrality interactions hold when run in the same model. Table 3 shows that both association membership and business press interactions hold when run in the same model. All other possible combinations of two interactions (size and association membership, size and business press, etc.), when run together, produced significant interaction effects. Adding a third interaction to a single model, however, resulted in some nonsignficant interactions. This is most likely due to a lack of power. Detecting interactions in field settings such as this requires very large sample sizes (McClel-

land and Judd, 1993), and obtaining a sample sufficient to test four interactions in a single model would probably require more observations than there are publicly held firms in the U.S. The fact that we can run all possible combinations of two interactions and get significant results, however, suggests that nonsignificant findings in models with more than two interactions are not due to multicollinearity (which would affect the interpretation of the results) but to insufficient power to detect more than two interactions in a single model.

Partner Similarity Results

Table 4 presents results of the similarity (H6) analyses. Model 1 includes the main effects of number of acquisitions by interlock partners, focal firm size, focal firm centrality, and business association membership. Models 2 and 3 examine whether the similarity of interlock partners influences the strength of the relationship between acquisitions of the interlock partners and acquisitions of the focal firm (H6). In 125 cases the focal firm had more than one interlock partner. Testing the similarity of all interlock partners as independent transactions violates the assumptions of independence in statistical inference. We therefore randomly selected one interlock partner for each firm that had multiple partners. The number of acquisitions completed by the selected interlock partner was used instead of the number of acquisitions by all interlock partners. In model 2, we enter the main effect for similarity of the randomly selected interlock partner. Results show that the number of acquisitions by that one randomly selected partner is still related to the number of acquisitions by the focal firm. Model 3 adds the interaction between industry similarity and the acquisitions by interlock partners. As predicted by H5, similarity strengthened the effect of the interlock. The interaction between industry similarity and the number of acquisitions by the interlock partners is positive and significant.

To avoid having to select one interlock partner randomly and to investigate the similarity effect in more detail, we also ran analyses in which we entered the number of acquisitions for firms in each of our four similarity categories (same 2-digit SIC, same 1-digit SIC, etc.) into the models. These results are reported in models 4–8 of table 4. Results of model 4 show that the number of prior acquisitions by interlock partners in the same 2-digit SIC (the most similar partners) is significantly related to the number of current acquisitions by the focal firm. Model 5 shows that the number of prior acquisitions by interlock partners in the same 1-digit SIC is weakly related to the number of current acquisitions by the focal firm (the effect in model 5 is significant at the .07 level). Model 6 shows that the number of prior acquisitions by interlock partners in the same general category (manufacturing, mining, service) is unrelated to the number of current acquisitions by the focal firm. Surprisingly, model 7 shows that the number of prior acquisitions by dissimilar interlock partners is also related to the number of current acquisitions by the focal firm. Inspecting the data in this category shows that this effect was primarily driven by banks. Our focal firms are dissimilar from banks, and yet when bank interlock partners did acquisitions, focal firms did acquisitions. Model

Table 4

Negative Binomial Regression Analysis of Number of Acquisitions Completed by the Focal Firm*

Variable	Model (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
N Acquisitions by interlock partners (Yr. 1 . . . Yr. 3)	.029**	.027**	.028**					
	(.011)	(.011)	(.012)					
(Log) Focal firm size	.102	.098	.096	.104	.102	.100	.104	.141
	(.083)	(.087)	(.084)	(.060)	(.062)	(.062)	(.063)	(.095)
Focal firm centrality	.137**	.131**	.130**	.133**	.132**	.133**	.134**	.109**
	(.029)	(.030)	(.030)	(.032)	(.031)	(.029)	(.030)	(.034)
Association membership	.208	.193	.193	.242	.232	.230	.211	.020
	(.218)	(.219)	(.240)	(.211)	(.215)	(.211)	(.233)	(.226)
Partner similarity		.053	.056					
		(.073)	(.074)					
Partner similarity × *N* acqsns. by interlock partners			.018**					
			(.007)					
N Acquisitions by partners in same 2-digit SIC				.148**				.151**
				(.042)				(.041)
N Acquisitions by partners in same 1-digit SIC					.069			.064
					(.037)			(.037)
N Acquisitions by partners in same mfg. wholesale, or service category						.142E-3		.217E-3
						(.287E-3)		(.292E-3)
N Acquisitions by dissimilar partners							.037**	.043**
							(.011)	(.011)
Control variables								
Year 1982	.051	.055	.055	.078	.064	.064	.318	.165
	(.502)	(.502)	(.502)	(.455)	(.454)	(.455)	(.455)	(.517)
Year 1983	.087	.115	.121	.133	.086	.123	.160	.232
	(.745)	(.747)	(.749)	(.589)	(.589)	(.589)	(.488)	(.771)
Year 1984	−.118	−.091	−.083	.006	.118	.005	.026	−.377
	(.520)	(.520)	(.522)	(.453)	(.452)	(.457)	(.453)	(.556)
Year 1985	.270	.287	.300	.311	.550	.506	.285	.046
	(.781)	(.780)	(.783)	(.573)	(.567)	(.568)	(.578)	(.802)
Year 1986	1.32	1.36	1.37	1.13	1.45*	1.34*	1.23*	.824
	(.827)	(.829)	(.831)	(.618)	(.606)	(.610)	(.608)	(.886)
Year 1987	1.90*	1.95*	1.97*	1.60*	1.80*	1.70*	1.60*	1.34
	(.996)	(.999)	(1.00)	(.719)	(.714)	(.717)	(.720)	(1.05)
Year 1988	.139	.190	.180	−.075	.118	.109	−.057	−.270
	(.923)	(.926)	(.929)	(.694)	(.687)	(.683)	(.689)	(.965)
Year 1989	.318	.350	.367	.228	.312	−.247	−.004	−.210
	(.777)	(.778)	(.782)	(.589)	(.589)	(.590)	(.598)	(.818)

Table 4 (*continued*)

Variable	Model (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year 1990	.195	.175	.208	.058	−.043	−.227	−.139	−.155
	(.715)	(.715)	(.725)	(.569)	(.576)	(.594)	(.573)	(.746)
SIC 36	−.648**	−.659**	−.655**	−.499**	−.531**	−.639**	−.595**	−.704**
	(.215)	(.215)	(.216)	(.209)	(.210)	(.219)	(.211)	(.227)
SIC 37	−.225	−.267	−.253	−.252	−.188	−.307	−.310	−.339
	(.240)	(.245)	(.252)	(.240)	(.283)	(.251)	(.244)	(.253)
SIC 50	−.213	−.213	−.215	−.252	−.170	−.166	−.213	−.291
	(.195)	(.195)	(.195)	(.189)	(.186)	(.185)	(.187)	(.199)
Free cash flow	−.575E-3	−.608E-3	−.630E-3	−.119E-3	−.113E-2	−.105E-2	−.919E-3	−.163E-3
	(.118E-2)	(.118E-2)	(.119E-2)	(.115E-2)	(.114E-2)	(.115E-2)	(.114E-2)	(.119E-2)
Return on assets	−.017	−.016	−.017	.004	.013	−.012	.025	.016
	(.023)	(.022)	(.022)	(.019)	(.019)	(.250)	(.198)	(.252)
Income growth	.241E-3	.255E-3	.256E-3	.218E-3	.185E-3	.203E-3	.168E-3	.165E-3
	(.212E-3)	(.213E-3)	(.214E-3)	(.205E-3)	(.205E-3)	(.205E-3)	(.206E-3)	(.207E-3)
Debt/equity	.290**	.291**	.289**	.292**	.295**	.294**	.297**	.306**
	(.092)	(.092)	(.092)	(.087)	(.087)	(.086)	(.088)	(.093)
N Prior acquisitions by focal firm (Yr. 1 . . . Yr. 3)	.179**	.175**	.177**	.206**	.216**	.209**	.206**	.188**
	(.026)	(.027)	(.029)	(.024)	(.024)	(.024)	(.024)	(.025)
N Acquisitions by all firms (Yr. 1 . . . Yr. 3)	−.531E-3	−.555E-3*	−.567E-3	−.507E-4*	−.569E-3**	−.525E-3*	−.597E-3*	−.358E-3
	(.372E-3)	(.374E-3)	(.378E-3)	(.216E-3)	(.215E-3)	(.216E-3)	(.216E-3)	(.218E-3)
Focal firm status	.008	.008	.008	.008	.016*	.014*	.010	.010
	(.009)	(.009)	(.009)	(.007)	(.007)	(.007)	(.007)	(.009)
α	.012	.016	.133	.018	.015	.016	.012	.120
	(.116)	(.121)	(.130)	(.128)	(.105)	(.114)	(.118)	(.121)
−2 Log likelihood	598.22	597.76	591.64	595.28	603.05	605.90	595.48	585.42
D.f.	22	23	24	22	22	22	22	25
Chi-square against previous model		.46	6.12**					12.80**†
D.f.		1	1					3

* $p < .05$; ** $p < .01$; two-tailed tests.
* Unstandardized coefficients are reported. Standard errors are in parentheses.
† Chi square is against model 1.

8 puts all four of these similarity variables into the same model, and all effects hold.

Decomposing this similarity effect shows that, in general, the more dissimilar the interlock partner, the less influential its acquisitions are on those of the focal firm. Similar partners are generally more influential than dissimilar ones, which is why the interaction effect in model 3 is positive. The exception is banks, which are also influential. These results are consistent with Haunschild (1993), who found that the relationship between acquisitions by focal firms and acquisitions by their interlock partners held both when the interlock partners were banks and nonbanks, but the nonbank effect was stronger.

Alternate Explanations

There are some obvious alternative explanations for a relationship between the number of acquisitions completed by focal firms and number of prior acquisitions completed by their interlock partners (H1). Many of these explanations take the form of an omitted variable—some variable (independent of information) may explain both the number of acquisitions by the focal firm and the number of acquisitions by its interlock partners. There are some managerial theories, for example, that propose that managers do acquisitions for personal gain, e.g., power, prestige, and/or the higher salaries that come with managing larger companies. It may be that these managers tend to sit on each other's boards. Such omitted variable explanations, however, would operate simultaneously in both the focal firms and their interlock partners, which means that the time-ordered nature of our test (prior acquisitions by interlock partners being related to current acquisitions by focal firms) is not necessary for these explanations. We can therefore test the validity of these alternate explanations by seeing if current acquisitions by interlock partners are related to current acquisitions by focal firms. Since acquisitions take time to complete, this current-current relationship should not hold. Omitted variables, however, are likely to be related to the number of acquisitions completed in the current year. We therefore ran models using current acquisitions by the interlock partners as an independent variable and found that they were not related to current acquisitions by the focal firms. This suggests that the omitted variable explanations for the effects of hypothesis 1 are unlikely to hold.

A second issue related to our finding that current acquisitions by interlock partners are related to prior acquisitions by focal firms is one of causal ordering. Are existing interlocks being used for information, or are firms deciding to do acquisitions and then inviting executives with acquisition experience onto their boards? To test this ordering issue, we dropped all received interlocks that had been in existence less than four years and reran the analyses. We were thus looking at only the longer-duration ties, which are unlikely to have been formed specifically to facilitate acquisitions occurring four or more years in the future. Acquisitions by focal firms were still positively related to prior acquisitions by its interlock partners, even when the newer partners were dropped from the analysis. This makes the idea that inter-

locks were established specifically to learn about acquisitions less likely, as long-duration interlocks produce the same information effects as short-duration interlocks.

DISCUSSION AND CONCLUSION

Overall, these results provide evidence that alternate sources of information affect the influence of interlock partners on acquisition decisions. Returning to our original question of when interlocks matter, they appear to matter less for large firms, for central firms, and for firms whose CEO belongs to the Business Roundtable or Business Council. Interlocks matter more for activities that get large amounts of business press coverage. And interlocks with similar firms matter more than interlocks with dissimilar firms.

These results suggest that large firms and central firms have more access to information than small firms and noncentral firms, so their interlock partners carry less weight as an information source. The results also support the idea that CEOs' membership groups and the business press offer alternate sources of information that affect interlock influence. The fact that we obtained independent interaction effects for size, centrality, and association membership (and these effects are independent of firm financial position) suggests that each of these measures is capturing a different source of information. Size (independent of centrality and association membership) is likely to represent internal information resources.[3] Centrality (independent of size and association membership) is likely to represent external information. Association membership (independent of size and centrality) is likely to be external information from association members, but different from the external information obtained through centrality. All of these information resources reduce the impact of information flowing through the interlock.

Information Substitution

Contrary to our expectations, we found that business press articles strengthened the impact of the interlock relationship. The explanation for why one alternate source of information (membership in the roundtable/council) would weaken the interlock relationship while another source (the business press) strengthens it may lie in the properties of these various information sources. Some information sources are substitutable, while others act as complements for each another. Substitutes reduce each other's impact; complements increase impact. It is likely that two sources of information that have the same source and message characteristics substitute for each other, reducing impact. Sources with different source and message characteristics will complement each other, increasing impact. Following this logic, interlocks and associations substitute for each other because they involve similar source and message characteristics. Interlocks are personal contacts. Sitting on a board and watching other top corporate officers complete acquisitions provides vivid, concrete, firsthand knowledge and examples. Relationships on the Business Roundtable and Business Council are also personal. Information obtained from others in these forums probably carries the same persuasive properties as information obtained through the interlock, i.e., personal, vivid, and

3

Despite our efforts to narrow the size effect to an information effect (by, for example, controlling for status and centrality), it may still be that size is measuring more than access to information. Future research that directly measures the relationship between size, information, and interlock influence would therefore be valuable.

concrete. This similarity makes these two sources of information substitutable, lessening their individual impact when combined.

The business press, however, is different. As an impersonal media source, it has more pallid, secondhand examples. It also probably acts primarily as a source of normative information, as extensive coverage of acquisitions is likely to carry the implicit message that acquisitions are the thing to do. Such normative information is likely to complement other types of information, e.g., procedural information obtained through the director interlock. Thus, differences between director interlocks and the business press make these two sources of information complementary, increasing their individual impact when combined.

Complementary sources of information may increase impact because one source of information focuses attention on the information contained in other sources. For example, if directors read business press articles about acquisitions before discussions with interlock partners, the articles focus attention on acquisition activities by other directors. Issues are more likely to be noticed if they are consistent with an existing frame or schema (Nisbett and Ross, 1980) and if they have been primed (Fiske and Taylor, 1991). Directors thus are likely to attend more to the acquisitions of their interlock partners when the subject of acquisitions has been highlighted by the business press.

This suggests, then, that the properties of various information sources determine whether they are substitutes or complements. Interlocks and association memberships, because they are substitutable, reduce each other's impact. Interlocks and the business press, because they are complementary, increase each other's impact. Association membership and business press articles should also complement each other, because they involve different source and message characteristics. While we had not originally tested this interaction, we later ran a model with the interaction of association and business press, and, just like the interaction of interlocks and business press, it was positive and statistically significant (results available from the authors). This positive interaction supports the idea that the business press and association membership represent complementary information sources that enhance each other's impact and supports the complementarity/substitution ideas outlined above.

The above explanation begins to untangle the different properties of information and may help in understanding why certain types of interorganizational information persuade more than others. The explanation is necessarily speculative, however, and should be tested in different settings. These ideas about substitutability and complementarity also point to limitations in our knowledge of various sources of interorganizational information. While social psychology studies have explored the effects of factors like salience and vividness on interpersonal influence, the properties of different forms of interorganizational information remain largely unexplored. Research could profitably focus on the properties of different types of interorganizational information, such as whether the

information comes from a personal relationship, an impersonal relationship, or even a non-relationship.

The effects of information costs on information use and influence might also be useful to explore. We studied information sources that require little cost to access. Interlock partners, association members, and central firms gain information as a byproduct of previously established relationships, so accessing information about a specific activity (i.e., acquisitions) does not require much additional cost. Thus, firms have few disincentives to access all information available from these sources, which may result in the substitution/complementarity effects we observe. But the effect of an information source that is much costlier than others (e.g., attorneys, consultants) may be quite different. If used, it might be weighted more heavily than the inexpensive ones we studied and thus change the substitutability/complementarity pattern.

The results of this study support others showing that similar firms have more influence than dissimilar firms (Kraatz, 1995), although the influence of information from banks is an interesting effect. Whether bank interlocks are still influential in the 1980s and 1990s has been the subject of debate (Davis and Mizruchi, 1997). This study shows that they are still influential, at least as a source of information about acquisitions. We studied only one dimension of similarity, industry similarity. Other dimensions such as similarity in size, geographic proximity, and network position might also affect influence (see Kono et al., 1998; Davis and Greve, 1997, for recent work in this area). In addition, other (non-similarity) dimensions may also affect partner influence, including familiarity of one partner with another and the history of their relationship.

Future research could profitably analyze other types of information content than those studied here. The information transmitted through interlocks, for example, may vary depending on whether the director sits on the board of an acquiring or a target firm. In this study we found a relationship between focal acquirers and interlock partner acquirers. These acquirers may have also been targets. The information gained by directors from being a target may well be different and have different effects on the focal firm than the information gained from being an acquirer. Analyzing the content of business press information in more detail, possibly breaking it down into "positive," "neutral," and "negative" components could also be interesting. We found a positive effect of press coverage, suggesting that the press coverage of acquisitions is either primarily positive or primarily neutral, or that negative press does not decrease the rate of acquisition (or affect interlock influence). It would be useful to investigate negative press in more detail to see whether it has a depressing effect on the initiation of firm activities. It is not at all clear that it would, as recent research has shown that as long as outcomes are salient, activities with both positive and negative outcomes will be imitated (Haunschild and Miner, 1997).

For network theorists, the results of our study add to the now widely shared view that tie content matters, that differ-

ent types of ties have different effects. For those interested specifically in interlocks, our results show that we need to reconsider the implicit assumption that all interlocks have uniform importance. To address the debate about whether or not interlocks are important, we examined when they are important. We did this through the information perspective. Whether or not information serves as a primary purpose of interlocks, we show that interlocks act as an information path among firms. Some types of information make the path less influential, while other types make it more so. This approach, investigating the conditions under which interlocks are influential, might be useful for other interlock perspectives.

We have shown that interlocks matter by finding when they matter. In today's world, we must understand the complexity of multiple sources of information. We need to answer three different questions: (1) What types of information have influence? (2) What properties of each type of information make it influential? and (3) How do these different types of information and their properties interact and influence each other? These questions become critical as the number of sources and amount of information transmitted through each source multiplies. Understanding the interactions of multiple sources of information is more important than how each single piece of information acts in isolation. And while this complexity offers a daunting challenge to researchers, we have little choice but to try to meet it, for the world shows no signs of simplifying.

REFERENCES

Barnett, William P.
1997 "The dynamics of competitive intensity." Administrative Science Quarterly, 42: 128–160.

Barron, David N.
1992 "The analysis of count data: Overdispersion and autocorrelation." In Peter V. Marsden (ed.), Sociological Methodology: 179–220. Oxford: Basil Blackwell.

Bavelas, Alex
1950 "Communication patterns in task oriented groups." Journal of the Acoustical Society of America, 22: 725–730.

Becketti, Sean
1986 "Corporate mergers and the business cycle." Economic Review Federal Reserve Bank of Kansas City, 71: 13–26.

Burns, Lawton R., and Douglas R. Wholey
1993 "Adoption and abandonment of matrix management programs: Effects of organizational characteristics and interorganizational networks." Academy of Management Journal, 36: 106–138.

Burt, Ronald S.
1983 Corporate Profits and Cooptation: Networks of Market Constraints and Directorate Ties in the American Economy. New York: Academic Press.

Cronbach, Lee
1987 "Statistical tests for moderator variables: Flaws in analysis recently proposed." Psychological Bulletin, 102: 414–417.

Davis, Gerald F.
1991 "Agents without principles? The spread of the poison pill through the intercorporate network." Administrative Science Quarterly, 36: 605–633.
1996 "The significance of board interlocks for corporate governance." Corporate Governance, 4: 154–159.

Davis, Gerald F., Kristina A. Diekmann, and Catherine H. Tinsley
1994 "The decline and fall of the conglomerate firm in the 1980s: The deinstitutionalization of an organizational form." American Sociological Review, 59: 547–570.

Davis, Gerald F., and Henrich R. Greve
1997 "Corporate elite networks and governance changes in the 1980s." American Journal of Sociology, 103: 1–37.

Davis, Gerald F., and Mark Mizruchi
1997 "The money center cannot hold: Commercial banks and the US system of corporate governance." Working paper, School of Business, Columbia University.

Davis, Gerald F., Catherine H. Tinsley, and Kristina A. Diekmann
1995 "Acquisitions by large industrials in the late 1980s: The twilight of unrelated diversification?" Working paper, School of Business, Columbia University.

DiMaggio, Paul J., and Walter W. Powell
1983 "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields." American Sociological Review, 48: 147–160.

Dopuch, Nicholas, Robert W. Holthausen, and Richard W. Leftwich
1986 "Abnormal stock returns associated with media disclosures subject to qualified audit opinions." Journal of Accounting and Economics, 8: 93–227.

Festinger, Leon
1954 "A theory of social comparison processes." Human Relations, 7: 117–140.

Fiske, Susan T., and Shelley E. Taylor
1991 Social Cognition. New York: McGraw-Hill.

Fligstein, Neil
1995 "Networks of power or the finance conception of control? Comment on Palmer, Barber, Zhou, and Soysal." American Sociological Review, 60: 500–503.

Fligstein, Neil, and Peter Brantley
1992 "Bank control, owner control, or organizational dynamics: Who controls the large modern corporation?" American Journal of Sociology, 98: 280–307.

Fowler, Karen L., and Dennis R. Schmidt
1988 "Tender offers, acquisitions and subsequent performance in manufacturing firms." Academy of Management Journal, 31: 962–974.

Galbraith, James
1973 Designing Complex Organizations. Reading, MA: Addison-Wesley.

Golbe, Devra, and Lawrence White
1988 "A time-series analysis of mergers and acquisitions in the U.S. economy." In Alan J. Auerbach (ed.), Corporate Takeovers: Causes and Consequences: 265–302. Chicago: University of Chicago Press.

Granovetter, Mark
1973 "The strength of weak ties." American Journal of Sociology, 78: 1360–1380.

Greene, William H.
1992 LIMDEP Version 6.0. New York: Econometric Software Inc.
1993 Econometric Analysis, 2d ed. New York: MacMillan.

Haunschild, Pamela R.
1993 "Interorganizational imitation: The impact of interlocks on corporate acquisition activity." Administrative Science Quarterly, 38: 564–592.
1994 "How much is that company worth?: Interorganizational relationships, uncertainty, and acquisition premiums." Administrative Science Quarterly, 39: 391–411.

Haunschild, Pamela R., and Anne S. Miner
1997 "Modes of interorganizational imitation: The effects of outcome salience and uncertainty." Administrative Science Quarterly, 42: 472–500.

Haveman, Heather A.
1993 "Follow the leader: Mimetic isomorphism and entry into new markets." Administrative Science Quarterly, 38: 593–627.

Hawthorne, Fran
1992 "A black eye for the Roundtable." Institutional Investor, 26: 83–87.

Heckman, James J., and George J. Borjas
1980 "Does unemployment cause future unemployment: Definitions, questions, and answers from a continuous time model of heterogeneity and state dependence." Econometrica, 47: 247–283.

Hirsch, Paul
1986 "From ambushes to golden parachutes: Corporate takeovers as an instance of cultural framing and institutional integration." American Journal of Sociology, 91: 800–837.

Hovland, Carl I., and Walter Weiss
1951 "Influence of source credibility on communication effectiveness." Public Opinion Quarterly, 15: 635–650.

Ingram, Paul, and Crist Inman
1996 "Institutions, intergroup competition, and the evolution of hotel populations around Niagara Falls." Administrative Science Quarterly, 41: 629–658.

Jaccard, James, Robert Turrisi, and Choi K. Wan
1990 Interaction Effects in Multiple Regression. Newbury Park, CA: Sage.

Jensen, Michael C.
1987 "The free cash flow theory of takeovers: A financial perspective on mergers and acquisitions and the economy." In Lynn E. Browne and Eric S. Rosengren (eds.), The Merger Boom: 102–143. Boston: Federal Reserve Bank.

Koenig, Thomas, Robert Gogel, and John Sonquist
1979 "Models of the significance of interlocking corporate directorates." American Journal of Economics and Sociology, 38: 173–186.

Kono, Clifford, Donald Palmer, Roger Friedland, and Matthew Zafonte
1998 "Lost in space: The geography of corporate interlocking directorates." American Journal of Sociology, 103: 863–911.

Kotz, David M.
1978 Bank Control of Large Corporations in the United States. Berkeley, CA: University of California Press.

Kraatz, Matthew K.
1995 "The role of interorganizational networks in shaping strategic adaptation: Evidence from liberal arts colleges." Academy of Management Best Paper Proceedings: 246–250.

Leavitt, Harold J.
1951 "Effects of certain communication patterns on group performance." Journal of Abnormal and Social Psychology, 46: 38–50.

Lehn, Kenneth, and Annette Poulsen
1989 "Free cash flow and stockholder gains in going private transactions." Journal of Finance, 44: 771–789.

Liao, Tim F.
1994 Interpreting Probability Models. Thousand Oaks, CA: Sage.

Lorsch, Jay W., and Elizabeth MacIver
1989 Pawn or Potentates: The Reality of America's Corporate Boards. Boston: Harvard Business School Press.

Mariolis, Peter, and Maria H. Jones
1982 "Centrality in corporate interlock networks: Reliability and stability." Administrative Science Quarterly, 27: 571–584.

McClelland, Gary H., and Charles M. Judd
1993 "Statistical difficulties of detecting interactions and moderator effects." Psychological Bulletin, 114: 376–390.

Mintz, Beth, and Michael Schwartz
1985 The Power Structure of American Business. Chicago: University of Chicago Press.

Mizruchi, Mark S.
1982 The American Corporate Network: 1904–1974. Beverly Hills, CA: Sage.
1992 The Structure of Corporate Political Action: Interfirm Relationships and Their Consequences. Cambridge, MA: Harvard University Press.
1996 "What do interlocks do? An analysis, critique, and assessment of research on interlocking directorates." Annual Review of Sociology, 22: 271–298.

Mizruchi, Mark S., and Linda Brewster Stearns
1994 "A longitudinal study of borrowing by large American corporations." Administrative Science Quarterly, 39: 118–140.

Morck, Randall, Andrei Shleifer, and Robert W. Vishny
1990 "Do managerial objectives drive bad acquisitions?" Journal of Finance, 45: 31–48.

Nisbett, Richard E., and Lee Ross
1980 Human Inference: Strategies and Shortcomings of Social Judgment. Englewood Cliffs, NJ: Prentice-Hall.

Palmer, Donald
1983 "Broken ties: Interlocking directorates and intercorporate coordination." Administrative Science Quarterly, 28: 40–55.

Palmer, Donald, Brad M. Barber, and Xueguang Zhou
1995 "The finance conception of control: 'The theory that ate New York?' Reply to Fligstein." American Sociological Review, 60: 504–508.

Palmer, Donald, Brad M. Barber, Xueguang Zhou, and Yasemin Soysal
1995 "The friendly and predatory acquisition of large U.S. corporations in the 1960s: The other contested terrain." American Sociological Review, 60: 469–499.

Palmer, Donald, P. Devereaux Jennings, and Xueguang Zhou
1993 "Late adoption of the multidivisional form by large U.S. corporations: Institutional, political, and economic accounts." Administrative Science Quarterly, 38: 100–131.

Pennings, Johannes M.
1980 Interlocking Directorates. San Francisco: Jossey-Bass.

Pfeffer, Jeffrey, and Gerald Salancik
1978 The External Control of Organizations: A Resource Dependence Perspective. New York: Harper and Row.

Podolny, Joel M.
1994 "Market uncertainty and the social character of economic exchange." Administrative Science Quarterly, 39: 458–483.

Podolny, Joel M., and Toby E. Stuart
1995 "A role-based ecology of technological change." American Journal of Sociology, 100: 1224–1260.

Rogers, Everett M.
1995 Diffusion of Innovations, 4th ed. New York: Free Press.

Roll, Richard
1986 "The hubris hypothesis of corporate takeovers." Journal of Business, 59: 197–212.

Selznick, Peter
1957 Leadership in Administration: A Sociological Interpretation. Evanston, IL: Row, Peterson.

Simon, Herbert A.
1955 "A behavioral model of rational choice." Quarterly Journal of Economics, 69: 99–118.
1956 "Rational choice and the structure of the environment." Psychological Review, 63: 129–138.

Stern, Gabriella
1995 "Chrysler directors' takeover experience could be a factor in Kerkorian's favor." Wall Street Journal, April 17: 3.

Sterngold, James
1995 "I.B.M.'s big move: The corporate culture; Suddenly, the hostile takeover is a benevolent act." New York Times, June 7: 1

Stinchcombe, Arthur
1990 "Weak structural data review of Mizruchi and Schwartz, *Intercorporate Relations*." Contemporary Sociology, 19: 380–382.

Useem, Michael
1984 The Inner Circle. New York: Oxford University Press.

Wasserman, Stanley, and Katherine Faust
1994 Social Network Analysis: Methods and Applications. Cambridge: Cambridge University Press.

Zajac, Edward J.
1988 "Interlocking directorates as an interorganizational strategy: A test of critical assumptions." Academy of Management Journal, 31: 428–438.

Zeitlin, Maurice
1974 "Corporate ownership and control: The large corporation and the capitalist class." American Journal of Sociology, 79: 1073–1119.