

The simplest social context for trust is an isolated dyad—two people away from others. The more usual context is two people surrounded by various close friends, foes, and acquaintances. We argue that third-party gossip amplifies both the positive and the negative in a relationship, making ego and alter more certain of their trust (or distrust) in one another. We draw three broad conclusions from an analysis of network data on a probability sample of diverse senior managers: (a) Trust is associated with relation strength, as expected in private games; (b) as predicted by the gossip argument for public games, trust is significantly amplified by third parties (third parties have a positive effect on trust within strong relations, and a negative effect on trust within weak relations); and (c) different forms of indirect connection are responsible for the third-party effects on trust.

Kinds of Third-Party Effects on Trust

RONALD S. BURT
MARC KNEZ
University of Chicago

Trust plays an ambiguous role in contemporary images of organization. Trust is essential to the loose coupling that makes network organizations more adaptive to changing environments. However, the dense relations argued to sustain trust also produce the tight-coupling rigidity for which trust and loose coupling are the cure.

Much of the ambiguity about organizing to produce trust is resolved by focusing on the simplest social conditions for trust, then studying how trust changes as the simple conditions aggregate into social structures. The sim-

Authors' Note: *The results reported here were first presented at Rod Kramer and Tom Tyler's May 1994 Stanford University conference on Trust in Organizations. We owe a note of gratitude to the conference participants for the lively debate that sharpened the argument. In particular, discussion with Bob Gibbons sharpened our argument about how third parties amplify trust and distrust, discussion with Rod Kramer sharpened our analysis of cliques and group affiliation effects, and Blair Sheppard's and Bob Bies's comments sharpened our discussion of how distrust builds in indirect connections through exclusive third parties to define the "ambient heat" of an organization.*

RATIONALITY AND SOCIETY, Vol. 7 No. 3, July 1995 255-292
© 1995 Sage Publications, Inc.

plest context for trust is an isolated dyad, two people disconnected from others. Their relationship is the cumulative result of their exchanges, or interaction games, with one another. Their games are private—their behavior displayed only to one another. Trust is by definition interpersonal, but rarely private. The usual context for trust is an embedded dyad, two people surrounded by their various interconnected friends, foes, and acquaintances. The two people play their games in public; a public composed of the third parties surrounding them. What produced trust between two people now involves third parties. The contrast between private and public games sets the empirical question for this article: How does trust vary with the strength of a relationship and its location in social structure?

1. TRUST IN PRIVATE GAMES

Exchange theory has trust produced in private games by a simple stimulus-response logic. The theory, rooted in turn-of-the-century British anthropology, is most associated with Homans's (1961) two-party analyses of social behavior, and Blau's (1964) two-party analyses of social exchange (see Ekeh 1974, 81-187, for historical exegesis of the individualistic British-American version of exchange theory contrasted with the French collectivist variant represented by Durkheim and Levi-Strauss). Blau (1964, 112-3) argues that trust develops because social exchange involves unspecified obligations for which no binding contract can be written. When you exchange sensitive information with someone, for example, trust is implicit in the risk you now face that the other person might leak the information. Putting aside Blau's moral obligation aspect of exchange to focus on parameters of cost-benefit calculation (cf. Ekeh 1974, 175), Coleman (1990, chap. 5) captures trust more concretely for his systems of two-party exchange and provides the metaphor for our analysis—trust is committing to an exchange before you know how the other person will reciprocate. Coleman focuses on social factors in the decision to trust (and we will return to his analysis to describe public games), but his crisp definition of trust is also useful for analyzing private games. The essential tension of trust in private games is illustrated by the decision rule in a Prisoner's Dilemma game.

Relations built from private games can be analyzed as the outcome of repeated Prisoner's Dilemma games, each game another cycle of social exchange (see Hardin 1990, 364ff, on the social exchange substance of the game). Axelrod's (1984) simulation of cooperation in two-person games is intriguing and widely cited evidence for arguments that trust emerges with

cooperation in repeated games. Two players choose in each game to cooperate or not. Both players get a high payoff if they both cooperate. Both get a low payoff if both choose not to cooperate. The maximum payoff occurs when one person cooperates and the other does not. The cooperator gets the “sucker’s payoff” and the defector gets the maximum payoff. Tension exists because players decide whether to cooperate or not before they know what the other will do. The decision to cooperate is a decision to trust. If you do for the other, will he or she in future do for you or yours? Axelrod’s analysis shows how trust can emerge as the dominant form of interaction between a pair of people. Across the spectrum of concepts spanned by Barber’s (1983) distinctions between trust as moral order, competence, and obligation, we have reduced trust to a humble level: Trust is anticipated cooperation. We have two reasons. First, we want to keep trust a simple concept to more clearly focus on the complexity of social structural effects. More complex images of trust can emerge from complex structural effects producing trust. Second, anticipated cooperation is much of the trust essential to organization. The issue is not moral. It is office politics. Can you trust me to cooperate with your initiative?

Viewed as anticipated cooperation, trust is twice created by repeated interaction; from the past and from the future. From the past, repeated experience with a person is improved knowledge of the person. Cooperation in today’s game is a signal of future cooperation. Across repeated games with cooperative outcomes, you build confidence in the other person’s tendency to cooperate. From tentative initial exchanges, you move to familiarity, and more significant exchanges. The gradual expansion of exchanges promotes the trust necessary for them. From past cooperation, you expect future cooperation (cf. Zucker 1986, on process-based trust; Stinchcombe 1990, 164ff, on the information advantages of current suppliers for building trust). Further, the history of cooperation is an investment that would be lost if either party behaved so as to erode the relationship—another factor making it easier for each party to trust the other to cooperate (see Larson 1992, for discussion and anecdotal evidence on the importance in the long run for trust between firms). Blau (1968, 454) summarizes the process as follows: “Social exchange relations evolve in a slow process, starting with minor transactions in which little trust is required because little risk is involved and in which both partners can prove their trustworthiness, enabling them to expand their relation and engage in major transactions. Thus, the process of social exchange leads to the trust required for it in a self-governing fashion.” Where sociological models explain trust emerging from past exchanges, economic models look to the incentives of future exchanges (e.g., Axelrod 1984; Kreps 1990; Gibbons 1992, 88ff). The expectation that violations of trust will be

punished in future games leads players to cooperate even if defection would be more profitable in a single play of the game. From a game-theoretic perspective, the information contained in past experience and the potential for future interactions are inextricably linked. A player's willingness to forego short-term gains is based on the expectation that his or her current behavior will be used to predict his or her behavior in the future.

The prediction for private games is that trust and relation strength are correlated. Repeated cooperation strengthens the relationship between two people, increasing the probability that they "trust" each other. Their strengthened relationship in turn makes future cooperation more likely.

2. TRUST IN PUBLIC GAMES

Put the two-person game in a social context of one or more third parties to the game between ego and alter. What was a private game is now public.

A. PASSIVE THIRD PARTIES WATCH

With third parties now watching ego's game with alter, ego's behavior affects more than the probability of future alter cooperation—it also affects future cooperation with the third parties. Ego's cooperation signals to the third parties that ego is cooperative, adding to ego's "reputation" for being cooperative. If ego anticipates future interaction with the third parties, then ego has a reputation incentive to cooperate with alter. If ego believes that alter is similarly aware of the third parties, then ego can see alter's incentive to cooperate. Therefore, ego-alter cooperation and trust are more likely with third parties watching ego's game with alter.

This is a small step. Trust is produced by the same stimulus response mechanism that drives private games (e.g., see Blau 1964, 37ff, on impressing others; Kreps 1990, on reputation effects). Players act cooperatively in the short term because future partners use their current behavior to predict their future behavior. In a single interaction between ego and a particular alter, the third parties do not say or do anything. They are passive bystanders whose mere presence as future (active) players affects ego's behavior. By this argument, trust could be created simply by convincing ego that there are third-party witnesses with whom ego and alter will play later (e.g., point video cameras at ego and alter during game play). This model ignores the issue of transmission. Past ego and alter behavior are assumed to be trans-

mitted accurately to every other player. How is transmission affected when it occurs through a network of varyingly accurate third parties?

B. ACTIVE THIRD PARTIES GOSSIP

Let the third parties talk. Even such a minimal assumption of active third parties creates enormous complexity for theoretical analysis because so many conversation topics are possible (e.g., see White's [1992], magisterial work on stories and structure). We focus on one topic: gossip about alter. The third parties have knowledge of alter that they can communicate to ego in stories about games that alter has played.

Third-party gossip is varyingly relevant to two-person games. The social structure of third parties means that some ego-alter pairs of people hear numerous stories about one another while others hear few stories. A strong relation means three things; (a) the connected people have interacted cooperatively in the past, (b) there is some level of trust, and (c) they have some interest in one another (otherwise their tie would be weak). In looking for information on alter, ego turns to trusted contacts with knowledge of alter, and those contacts continue their cooperative relation with ego by sharing what information they have. The people likely to have knowledge of alter, and communicate it to ego, are the people strongly tied to both ego and alter. So, the stronger the indirect connection between ego and alter through mutual friends and acquaintances, the more interaction stories they will hear about one another.

The implication is that indirect connections "lock-in" relationships at positive and negative extremes by making ego more certain of his or her trust in alter. The implication follows whether stories are relayed with full or partial disclosure.

B1. Full Disclosure Gossip

Full disclosure has third parties telling complete and accurate stories. Imagine that the stories about alter's interaction games let ego participate vicariously in those games in the sense that vicarious play is in some ways emotionally the same as actual play. The social structure of third parties relaying the stories is like a broadcast system—reaching an audience of ego "armchair quarterbacks." For a game played, signals diffuse in stories about the game to create in ego a feeling of replicated game play. The more third-party indirect connections between ego and alter, the more replicating

accounts ego hears about alter—and so the more certain ego is of his or her trust in alter.¹

B2. Partial Disclosure Gossip

Partial disclosure has third parties telling incomplete stories about alter's past behavior. The following assumption provides a rationale for partial disclosure and provides some predictions of its impact through alternative third-party structures. Assume that the third party can strengthen his or her relation with ego by highlighting the similarity of their opinions of other people (a concrete indicator that the third party's values are consistent with ego's). Ego's tentative view of alter is apparent from a variety of cues ranging from the subtle nuance of a raised eyebrow or a skeptical tone when describing alter, to the blatant signal of expressing a positive or negative opinion. To strengthen his or her own relation with ego, the third party relays stories about alter that are consistent with ego's tentative view. If ego seems to trust alter, the third party relays stories of games in which alter cooperated. If ego seems to distrust alter, the third party relays stories in which alter defected. The more third-party indirect connections between ego and alter, the more replicating accounts ego hears that support his or her view of alter. The replicating accounts, like replicating signals from a sequence of actual games with alter, make ego certain that alter is to be trusted (repeated stories of alter cooperating) or distrusted (repeated stories of alter violating trust).²

B3. Positive and Negative Effects in Related Work

Economic and sociological analyses disproportionately concern the positive effect of dense networks. The trust likely between two strongly connected people is even more likely when the people are embedded in a network of mutual friends and acquaintances. Examples are numerous (e.g., see Bradach and Eccles 1989; Nohria and Eccles 1992; Swedberg 1993; and several chapters in the Smelser and Swedberg 1994, handbook, esp. Powell and Smith-Doerr 1994). Two widely known arguments for a positive correlation between trust and network density are Coleman's (1990, chaps. 5, 8, 12) analysis of trust and social capital, and Granovetter's (1985, 1992) discussion of trust emerging from "structural embeddedness" (trust is more likely between people with mutual friends): "My mortification at cheating a friend of long standing may be substantial even when undiscovered. It may increase when the friend becomes aware of it. But it may become even more unbearable when our mutual friends uncover the deceit and tell one another" (Granovetter 1992, 44). This is a sociology analog to Kreps's (1990) reputa-

tion effect. Indirect connections through mutual friends and acquaintances make game behavior more public, which increases the salience of reputation, making ego and alter more careful about the cooperative image they display, which increases the probability of ego-alter cooperation and trust. Here again is the future-past difference between economics and sociology. Where sociologists ensure trust with a dense network of past exchanges, economists look to the incentives of future exchanges with third parties. The difference is not in concept so much as research design. The sociological analysis is keyed to network data, which will let us estimate reputation effects, and so reveal social structural primitives to inform economic analysis.

With scholars focused on when it is safe to trust (dense network), rather than when it is advantageous to trust (sparse network), there is relatively little attention to the dark side of network density.³ However, the certainty produced by dense indirect connections can be negative or positive. Depending on the frame through which ego sees alter, alter can be trustworthy or treacherous.⁴ By the gossip argument, stories from third parties make ego more certain in his or her view of alter. The social process that makes ego more certainly positive can in the same way make for negative certainty.

The central conclusion from the gossip argument is that indirect connections affect trust intensity, not direction. The direction depends on conditions between ego and alter. It is this contingency on existing conditions that makes the gossip argument a rational choice intruder within institutional theory. Ego chooses whether or not to trust alter, but the choice menu is indirectly contingent on existing conditions through the gossip of interested third parties. Where ego has reason to suspect alter, indirect connections through mutual contacts will convey stories that corroborate the suspicion—making ego certain that he or she should distrust alter. Where ego has a strong relation with alter, indirect connections will convey stories that corroborate the strong tie—making ego certain that he or she can trust alter.

3. EVIDENCE

Our data come from a study of network structure and manager success (Burt 1992, chap. 4). The data are useful here because the manager respondents are a probability sample from a heterogeneous population of senior managers, and the data describe numerous kinds of relations, including indicators of trust and distrust. Here is a brief introduction to the data: The managers operate at the top of one of America's largest high-technology firms (over 100,000 employees at the time of the study). The study population—3,000 people just below vice president—is heterogeneous in the sense of

being scattered across regions of the country and corporate functions (sales and service, engineering, production, finance, human resources, marketing, and management) and regions of the country. The stratified probability sample of 284 managers who completed survey questionnaires is an unbiased sample from the population. Managers described their networks of key contacts in and beyond the firm (7 contacts minimum, 22 maximum, 12.6 average). Contacts were identified with nine name generator sociometric questions concerning diverse relations such as informal discussion and socializing, past political support, critical sources of buy-in for projects, authority relations, and so on. (A quick aside on causation: The gossip argument has ego trust emerging from a network of direct and indirect connections. The argument also plays in reverse; trust between ego and alter encourages certain patterns of relations. We discuss our empirical results in the causal language of the argument, but causation remains untested. The data are unusual in describing networks in a probability sample of diverse managers, but they are only a cross-sectional view. We return to the issue of causation in the Discussion section. What our results will establish is the strength and functional form of association between trust and third-party connections.)

A. STRONG AND WEAK RELATIONS

The 3,584 cited contacts are displayed in Figure 1 by the strength of their relationship with the manager. The networks are a mix of strong and weak relations that show the managers maintaining relations with distant contacts. The most typical relation inside the firm (813 of 2,939 relations) involves infrequent contact (monthly or less) with people known a long time (6 or more years). The left-hand side of Figure 1, labeled Frequency, indicates that managers speak with one fourth of the contacts every day (860 relations, 25%), but speak monthly or less often with almost half (48%). The center of Figure 1, labeled Duration, indicates that half of the contacts are people the manager has known for more than 5 years (51%), but many are new acquaintances, first met this year or the previous year (21%). The right-hand side of Figure 1, Emotion, indicates that one third of the relations are “especially close” (32%), but almost another third are at the other extreme of “less close or distant” (28%).

The graph to the far right of Figure 1 distinguishes relations by relative strength within each manager’s network. Emotional closeness response categories are given quantitative values, then divided by the sum of a manager’s relations to indicate the proportion of the manager’s network time and energy

allocated to each of the manager's contacts. This will be our primary measure of relationship strength. It offers fine-grained distinctions between levels of strength, corresponds to our data on relations between the contacts in a manager's network, provides the strongest association with trust and distrust, and successfully predicts manager success in the original study.⁵

B. TRUST

The main result in Figure 1 is that the data are consistent with a repeated games image of trust. The probability of trust increases up the vertical axis. Reading from left to right, solid lines describe how trust is more likely in stronger relations. Dashed lines describe how distrust is less likely in stronger relations. For example, of the 1,685 relations with contacts met once a month or less often (extreme left of graph), 289 are people cited for trust (solid line is at .172 on the vertical axis), and 176 are people cited for distrust (dashed line is at .105). Trust is more likely with contacts met every day (.172 increases to .322), and distrust is less likely (.105 decreases to .027).

None of the sociometric items are worded in terms of trust ("Who do you trust?" or "Who do you most trust of the people you named?"), but two questions have face and construct validity as indicators of trust. First the face validity, then construct.

Our indicator of trust is discussing job options in other firms: "If you decided to find a job with another firm doing the kind of work you do here, who are the two or three people with whom you would most likely discuss and evaluate your job options? These could be people who work here, or people outside the firm such as friends, family, or people who work at other firms." Managers responded with an average of three names (0 = minimum, 5 = maximum). This is not a comprehensive indicator. Managers probably trust people with whom they would not expect to discuss job options. Job option discussion is nevertheless a trust indicator in this study population. There is a hubris to making it in the firm (as in elite university departments). Employment is more than a contract, it is membership. Moving to another firm repudiates membership—especially for senior managers. Threatening to leave has implications for how you are treated. If word gets around that you want to leave the firm, you are irrelevant to the circulation of opportunities. You become a subject of, rather than a player in, the office gossip that builds solidarity among your colleagues. Your exit creates new opportunities, quickly carved up among your erstwhile colleagues, making it difficult for you not to leave the firm. In short, you do not discuss leaving the firm with just anyone.⁶

The solid lines in Figure 1 show that the probability of discussing job options in other firms increases with the strength of a relationship. It increases with the frequency of contact. It increases sharply if the manager has known the contact for more than 5 years. It increases most clearly with emotional closeness; job option discussion is eight times more likely in especially close relations than in less close or distant relations (.42 vs. .05). The graph to the far right of Figure 1 shows near-zero trust with the most distant contacts, increasing to over .5 with the closest contacts.

C. DISTRUST

Our indicator of distrust is a citation in response to asking managers "who has made it the most difficult for you to carry out your job responsibilities?" Citations are few. The usual response is to cite one person. The wording does not indicate distrust, but managers were asked to explain why they cited the person they did, and their explanations indicate distrust of the repeated-game kind (Burt and Celotto 1992, report the content analysis). The gist of the analysis is that the cited contacts are viewed as uncooperative. All kinds of contacts in the firm were cited. The typical explanation for citing a supervisor is his or her failure to lead: "no support; no coaching, no feedback," "didn't explain the firm's system/culture and advise me," or "egotistical, self-oriented, liar; worst manager I've ever met." Undermining teamwork is the typical explanation for citing a colleague in the manager's own function: "not a team player; does only what is good for himself." The problems are colleagues who pursue their "own agenda" rather than the interests of the group, who are "proprietary" rather than cooperative, who do not "follow through on their commitments," who cannot be "trusted." Typical explanations for citing peers in other functions express frustration over being denied political support: "didn't support my proposals," "had great power and withheld help," "high rank but doesn't open door, in fact he gets in the way," or "tree hugger; do it his way or don't do it at all." In short, the cited contacts are people viewed as routinely uncooperative (cf. Sitkin and Roth 1993).

We expect relations with uncooperative contacts to be weak because managers have little incentive to maintain them. As expected, the dashed lines in Figure 1 show how the probability of distrust decreases with the strength of a relationship. It is most likely with contacts met monthly or less. It is less likely with contacts known for a long time. It is most likely with contacts to whom the manager feels less close or distant—which is not surprising given the opinions quoted above.

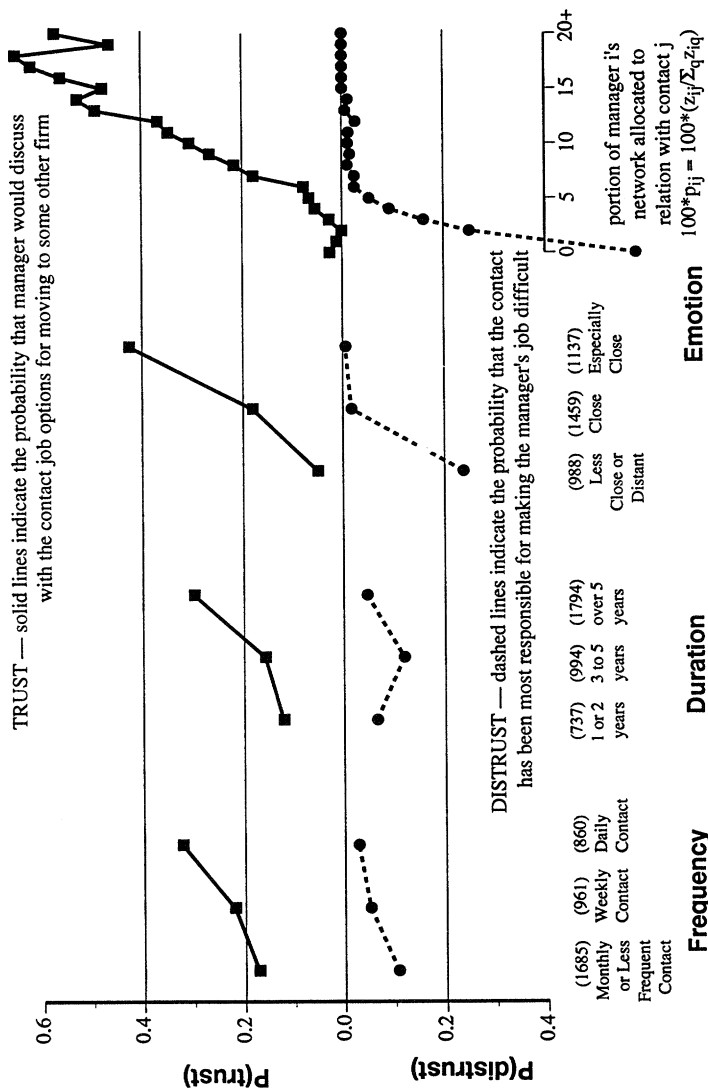


Figure 1: Direct connection increases probability of trust

NOTE: Number of relations in parentheses.

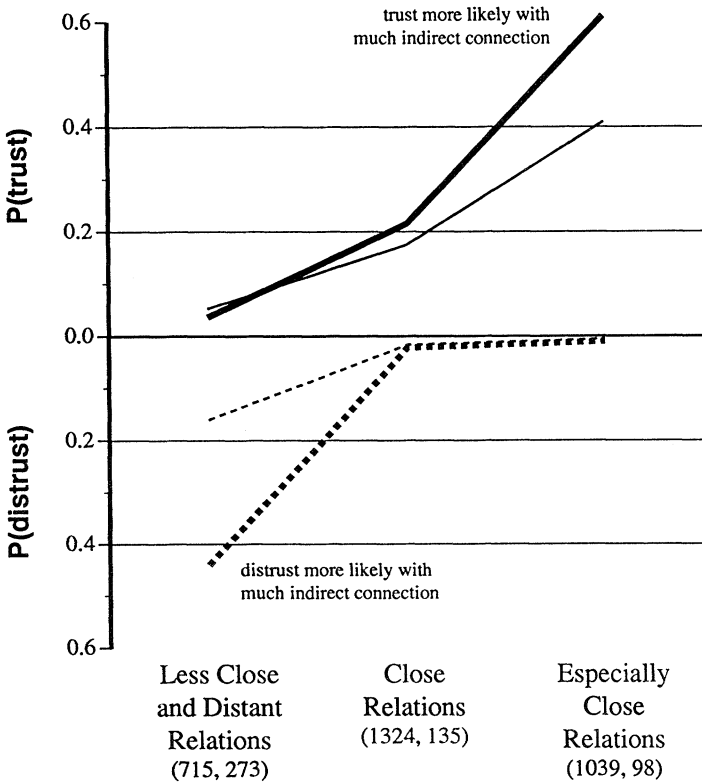


Figure 2: Trust and distrust more likely with much indirect connection

NOTE: Solid lines show probability of trust, dashed lines show probability of distrust, thin lines describe relations embedded in little indirect connection (private games), bold lines describe relations embedded in much indirect connection (public games), parentheses contain number of relations embedded in (little, much) indirect connection.

D. THIRD-PARTY EFFECTS

In Figure 2, the Figure 1 association between trust and direct connection is displayed for two social contexts: little versus much indirect connection (see Note 5 for the distinction). Thin (bold) lines describe relations embedded in little (much) indirect connection.

The solid lines at the top of Figure 2 show trust amplified within strong relations. The thin and bold lines are similarly close to zero over weak relations. Trust is unlikely in weak relations regardless of indirect connection

through third parties. Both lines are higher for stronger relations, with the bold line much higher than the thin over especially close relations. Of 1,039 especially close relations surrounded by little indirect connection, managers cite 41% as trustworthy. The odds increase to 61% of especially close relations embedded in extensive indirect connection.

The dashed lines at the bottom of Figure 2 show distrust amplified within weak relations. The thin and bold lines are similarly close to zero over close and especially close relations. Distrust is unlikely in strong relations, regardless of indirect connection through third parties. Distrust is more likely in less close and distant relations, especially if the weak relation is embedded in extensive indirect connection. Distrust increases from 16% of the weak relations surrounded by little indirect connection, to 44% of the weak relations with extensive indirect connection.

Is the amplification statistically significant? Table 1 contains ordinary least squares (OLS) regression results with continuous predictors. The metric coefficients are points of change in trust or distrust associated with a one-point increase in direct or indirect connection. The combined results are for a three-category dependent variable that varies from 50 for trusted contacts, -50 for distrusted contacts, and 0 for relations between the two extremes.⁷ The effects are significant, and their significance persists if relations outside the firm are ignored, if we use a logit model,⁸ or we control for autocorrelation.⁹

Direct connection predicts trust. Trust is likely in especially close relations (t tests = 12.0 and 12.6 in Table 1; $p < .001$), and unlikely in less close or distant relations (t tests = -8.5 and -8.8 in Table 1; $p < .001$).

The third-party effects of indirect connection are also apparent. The trust likely in an especially close relation is significantly more likely when the relation is embedded in extensive indirect connection (t tests = 3.7 to 6.7 in Table 1; $p < .001$). The trust unlikely in a weak relationship is significantly less likely when the relation is embedded in extensive indirect connection (t tests = -4.6 to -5.8 in Table 1; $p < .001$).

E. THE PROBABILITY OF TRUST

Figure 3 provides a better substantive feel for the effects. The graph shows how the probabilities of trust and distrust change as two people get closer—with and without indirect connections through third parties. The horizontal axis is relationship strength measured as in Figure 1 and Table 1 by the proportion of a manager's network invested in the relationship. Relations in our data vary from near-zero ($p_{ij} < .01$) to one third ($p_{ij} = .33$). Based on the displayed logit models, the vertical axis in Figure 3 is the probability of trust

TABLE 1: Trust Effects

	<i>Trust</i>		<i>Distrust</i>		<i>Combined</i>	
	<i>All Dyads</i>	<i>Within Firm</i>	<i>All Dyads</i>	<i>Within Firm</i>	<i>All Dyads</i>	<i>Within Firm</i>
Dyads	3,584	3,015	3,584	3,015	3,584	3,015
Multiple correlation	.39	.39	.47	.47	.51	.51
Intercept	-5.55	-12.25	3.25	4.73	-5.03	-9.50
DIRECT connection	2.55 (12.0)	2.67 (12.6)	-1.21 (-8.5)	-1.54 (-8.8)	1.99 (12.5) [12.1]	2.28 (13.1) [12.8]
INDIRECT connection	0.19 (0.9)	0.58 (2.9)	0.84 (6.3)	0.96 (6.1)	-0.30 (-2.3) [-0.6]	-0.18 (-1.3) [-0.1]
INDIRECT × STRONG	1.51 (9.7)	1.34 (8.3)			0.60 (6.7) [5.7]	0.44 (4.4) [3.7]
INDIRECT × WEAK			1.10 (11.0)	0.95 (8.2)	-0.57 (-5.8) [-5.7]	-0.47 (-4.6) [-4.7]

NOTE: These are ordinary least squares estimates of regression coefficients with routine *t* tests in parentheses, and *t* tests adjusted for autocorrelation in brackets (see Note 9). TRUST is 100 if the manager trusts the contact, 0 otherwise. DISTRUST is 100 if the manager distrusts the contact, 0 otherwise. COMBINED is 50 if the manager trusts the contact, -50 if the contact is distrusted, 0 otherwise. From manager to a specific contact, DIRECT is 100 times the proportional strength of the direct connection (p_{ij}), INDIRECT is 100 times the portion of relations that lead indirectly to the contact ($\sum_q p_{iq} p_{qj}$), STRONG is a dummy variable equal to 1 if the manager is especially close to the contact (0 otherwise), and WEAK is a dummy variable equal to 1 if the manager is less close or distant from the contact (0 otherwise). The metric coefficients are therefore the points of change in trust expected from a one-point increase in direct or indirect connection.

(top), and the probability of distrust (bottom). Thin lines show how probabilities change with a strengthening relationship between two people in isolation. Bold lines show the same probabilities—but for people embedded in extensive indirect connection through third parties.¹⁰

Two substantive points are illustrated in Figure 3. The first is that trust builds incrementally, while distrust is more catastrophic. The solid lines at the top of Figure 3 show the probability of trust building slowly and continuously across increasing levels of relation strength. The dashed lines at the bottom of the figure show that the probability of distrust is near zero across decreasing levels of relation strength, then increases sharply in especially weak relations.

connection generates a 2.6-point increase in trust. A one-point increase in indirect connection around an especially close relationship generates a smaller 1.7-point increase in trust (.19 + 1.51). Relative magnitudes are the opposite for distrust. In the third column of Table 1, a one-point increase in direct connection generates a 1.2-point decrease in distrust. A one-point increase in indirect connection around a weak relationship generates a larger 1.9-point increase in distrust (.84 + 1.10). Not only do we find evidence of the predicted dark side to network density, it turns out to be more potent than the familiar positive side in which extensive indirect connections increase the probability of trust within strong relationships.¹¹

4. KINDS OF DIRECT CONNECTIONS

For reasons given with Figure 1, we measure direct connection as a degree of emotional closeness. Popular alternatives are frequency, duration, and social homophily.¹² We find no evidence of frequency affecting trust above and beyond the network variables in Table 1, but duration and homophily do affect trust.¹³

A. DURATION

Duration has a binary association with trust. Trust and distrust are similar across the first 5 years, then trust jumps to continue at a high level, and distrust drops to continue at a low level (see Burt and Knez 1995a). Years known is correlated with the three-category trust variable in Table 1 (.21 correlation), but the correlation is zero across Years 1 to 5 (-.04 correlation), and zero across Years 6 and up (.04 correlation). The years-known correlation is captured with a binary duration variable that distinguishes people known for more than 5 years from people known for fewer years (.20 correlation). People seem to be sorted into two groups after 5 years (a period about equal to two job assignments in this firm); those you trust and with whom you maintain relations versus others you allow to drift away. Adding duration to the regression model in the last column of Table 1 shows that duration is a significant trust factor (t test = 3.9 for years known, t test = 5.0 for binary duration), but it does not change the conclusions about third-party effects. Indirect connection amplifying trust in strong relations (t test = 4.4) remains a strong 3.7, and amplified distrust in weak relations (t test = -4.6) remains a strong -4.2.

B. HOMOPHILY

Strong relations tend to connect similar kinds of people. The literature on this topic is extensive. The attributes that most pattern discussion relations between Americans are socioeconomic status (education, occupation, income), age, and race-gender combinations (see Burt 1990, for national probability data; cf. Zucker 1986, on characteristic-based trust). There are income, education, age, race, and gender differences within our study population, but the differences are trivial in comparison to the diversity of the American population. One attribute, however, does affect manager relations: gender. The connection between network structure and success in this firm shows that women are suspect at the senior ranks in the sense that they need a senior sponsor (Burt 1992, 74-8; cf. Ibarra 1992, 1994, for corroborating evidence and literature review). As in many firms, this could be a carryover from earlier times. Describing the firm a decade earlier, Kanter (1984) insightfully notices a variety of ways in which gender is linked with managerial behavior and success. Given the evidence of gender stratification among the managers, we expect trust to be more difficult between men and women.

It is, but in a nonobvious way that further illustrates third-party effects (detailed analysis of the gender effect is available elsewhere; Burt and Knez 1995a). Introducing gender is irrelevant in two senses: Trust is as likely between men and women as between people of the same sex, and third parties significantly amplify trust within all relations regardless of gender. The gender effect concerns the magnitude of third-party effects. Third parties are more important to trust between men and women than they are to trust between people of the same sex. In brief, third parties amplify trust between men and women (t test = 11.6) more than they amplify trust between people of the same sex (t test = 5.7). Or, stating the effect from the other end, the lack of mutual contacts inhibits trust between men and women. This is to be expected if gender differences inhibit relations. If communication is better between people of the same sex than it is between men and women—as it is in this study population—then gossiping third parties should have more effect on relations between men and women. With poor communication between Susan and Sam, Sam relies more on third parties relaying stories about Susan's past behavior. Without third parties connecting Sam and Susan, trust is difficult because Sam and Susan are uncertain about their respective interpretations of the other's behavior during past interactions with other parties or one another.

TABLE 2: Test Statistics for Trust Effects With Kinds of Indirect Connection

<i>Forms of Indirect Connection</i>	<i>Especially Close Relations</i> (n = 712)	<i>Less Close and Distant Relations</i> (n = 971)
1. INDIRECT (aggregate)	3.2	-9.3
Mutual third parties		
2. Σp_{ij} through TP1	3.0	3.0
3. Σp_{ij} through TP2	2.9	5.1
4. Σp_{ij} through TP1 or TP2	3.4	4.1
5. Number (TP1 + TP2)	2.6	4.5
Distant third parties		
6. Σp_{ij} through TP3	0.8	3.9
Exclusive third parties		
7. Σp_{ij} through TP4	-3.1	-0.4
8. Σp_{ij} through TP5	0.3	-3.6
9. Σp_{ij} through TP4 or TP5	-3.8	-7.3
10. Number (TP4 + TP5)	-5.0	-5.5

NOTE: These are routine *t* tests for ordinary least squares estimates of the row measure predicting three-category trust within column strength relations to people in the firm. INDIRECT is the aggregate measure of indirect connection in Table 1.

5. KINDS OF INDIRECT CONNECTIONS

We have shown that the strength of connection through third parties affects trust. The form of the connection also matters. Certain indirect connections increase trust. Certain others decrease trust.

Each row of Table 2 is a different measure of indirect connection predicting trust within strong and weak relations. The entries are *t* tests for the prediction. The relations are the 3,015 within the firm. (As in Table 1, we get the same pattern of results across all 3,584 relations to contacts inside and outside the firm.) Indirect connection in the first row is the aggregate measure used in Table 1. Indirect connection amplifies trust within strong relations (*t* test = 3.2), and amplifies distrust within weak relations (*t* test = -9.3).

Notice how effects differ between the rows. If all forms of indirect connection were similar conduits for third-party gossip, then the same pattern of positive and negative effects would appear in each row of Table 2. Instead, the rows differ. In rows 2 through 5, indirect connection increases trust within strong and weak relationships. In rows 7 through 10, indirect connection decreases trust within strong and weak relationships. The implication is that the aggregate positive and negative effects of indirect connection reported in

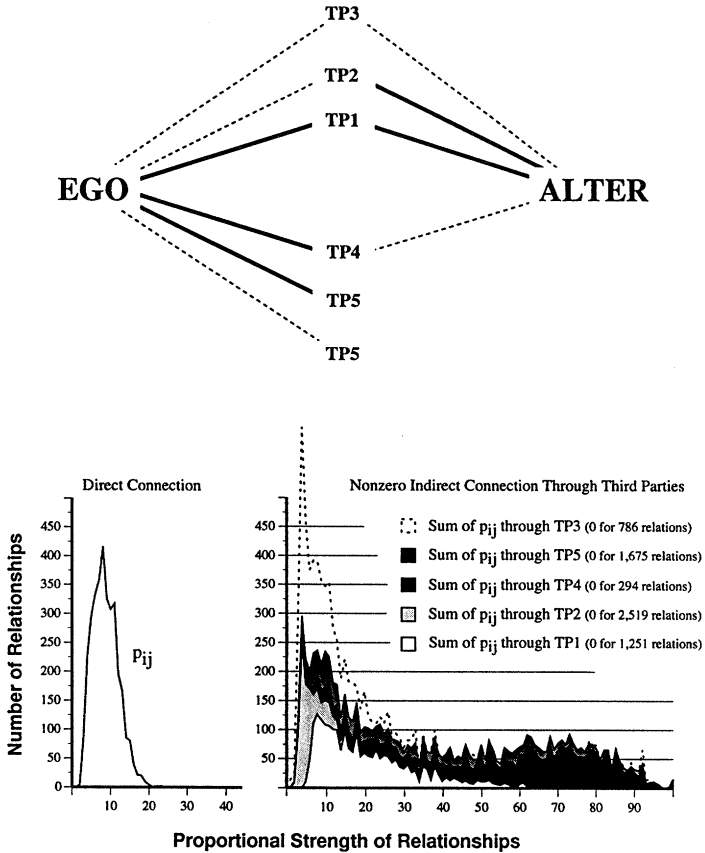


Figure 4: Kinds of indirect connections

the preceding analysis must result from a shifting balance between kinds of third parties around strong and weak relations.

A. POSITIVE INDIRECT CONNECTIONS: MUTUAL THIRD PARTIES

Five kinds of third parties are distinguished in Figure 4. The first two are similar in two ways: they are mutual contacts for ego and alter, and their only effect on trust is positive. The first kind (TP1) is a mutual friend strongly tied to ego and alter. This is the third party usually cited to illustrate sociological

analyses of density and trust (e.g., Coleman 1990; Granovetter 1992). Strong ties to ego and alter in Figure 4 are indicated by bold lines.¹⁴ The second kind of third party (TP2) is a close friend of alter's who ego mentions as one of his or her key contacts. Mutual third parties are characteristic of the networks around some managers, but are uncommon in the population. One third of the manager and contact pairs have no mutual friend in common (35%), and one quarter have only one mutual friend (26%). The white area in the Figure 4 graph quickly disappears at higher levels of indirect connection. In other words, managers frequently have to deal with people they and their closest contacts do not know well. The dense networks of mutual friends characteristic of family and neighborhood life are not characteristic of life at the top of corporate America.

Where mutual third parties do occur, however, they enhance trust. The measure in the second row of Table 2 is the sum of manager relations to TP1 third parties. The measure would be 15, for example, for a relationship where the manager has 5% proportional-strength relations to three especially close other people also especially close to the contact. The third row is the sum of proportional relations to TP2 third parties, and the fourth row is the sum to either kind of mutual third party. The proportional strength of manager relations to mutual third parties increases trust within strong relations between employees (t test = 3.4) and increases trust within weak relations (t test = 4.1). The fifth row of the table measures indirect connection simply by the number of mutual third parties connecting ego and alter. Even this simple count of mutual third parties is associated with higher trust within strong and weak relationships (t tests = 2.6 and 4.5, respectively).

These results are interestingly consistent with the gossip argument. The positive effects of TP1 third parties are not surprising, but TP2 third parties do not have the symmetric ties to ego and alter that in sociological arguments make ego and alter accountable to the same third parties so ego-alter trust is less of a risk. The interests of a TP2 third party—someone distant from ego and especially close to alter—lie more with alter. Stories about alter told to ego by TP2 third parties are more likely to paint a positive than a negative image of alter. Negative stories that ego tells about alter are less likely to find a sympathetic ear from TP2 third parties. Therefore, to the extent that ego's evaluation of alter is affected by stories, trust should increase with indirect connection through TP2 third parties—which is the result in the third row of Table 2. The asymmetry should not be overstated. We only know about the TP2 third parties because the manager counted them among his or her key contacts. Third parties close to alter in our data are in a sense mutual contacts to ego and alter because ego includes them as key contacts. Whether the third

party tie to ego is strong (TP1) or weak (TP2), the strong tie to alter means that ego and the third party are more likely to tell one another positive stories about alter, increasing ego's trust in alter.¹⁵

B. NEGLIGIBLE INDIRECT CONNECTIONS: DISTANT THIRD PARTIES

Third parties weakly connected to ego and alter—TP3 third parties in Figure 4—have no effect on ego-alter trust. They represent low volumes of interaction (dashed line in the graph at the bottom of Figure 4), but occur in large numbers. Four out of five manager relations have at least one mutual distant third party (78%), and those with any have an average of 3 (maximum of 15). Although another kind of mutual contact shared by ego and alter, the results in the sixth row of Table 2 show that distant third parties have no association with trust within strong relations between employees (t test = 0.8). Distant third parties are associated with higher trust within weak relations (t test = 3.9), but are a negligible correlate of trust across relations at all strength levels, $F(3, 3010) = 0.6$ for null hypothesis of no distant third-party effects on trust, $p = .59$. Distant third parties are an innocuous social structural “white noise” around all manager relationships.

C. NEGATIVE INDIRECT CONNECTIONS: EXCLUSIVE THIRD PARTIES

The last two kinds of third parties in Figure 4 amplify distrust. In row 9 of Table 2, indirect connection is measured by proportional relations to either of the two kinds. They significantly decrease trust within strong and weak relations (t tests = -3.8 and -7.3 , respectively). These are third parties close to ego and distant from alter; contacts more exclusive to ego, confidants on ego's side viewing alter as a distant contact. The TP4 third parties are people especially close to ego and weakly tied to alter. TP5 third parties are people tied in any way to ego and disconnected from alter. In a sense, the TP5 third parties are not intermediaries because they have no connection with alter. But at the top of the firm, everyone is to some degree known to everyone else. We combine TP4 and TP5 third parties into one category of exclusive third parties because they are similarly much closer to ego than to alter; indirect connections through them similarly increase distrust within weak relations, and no other kinds of third parties have that effect. Further, both kinds of third parties tend to be people with whom the manager gets together for informal socializing, and are unlikely to be important work contacts or essential sources of buy-in for the manager's projects (see Note 15). These exclusive third parties are the most numerous in this study population. In almost every

relationship (99.4%), the manager has someone who is his or her friend more than the other person's. The average is eight exclusive third parties per relationship.

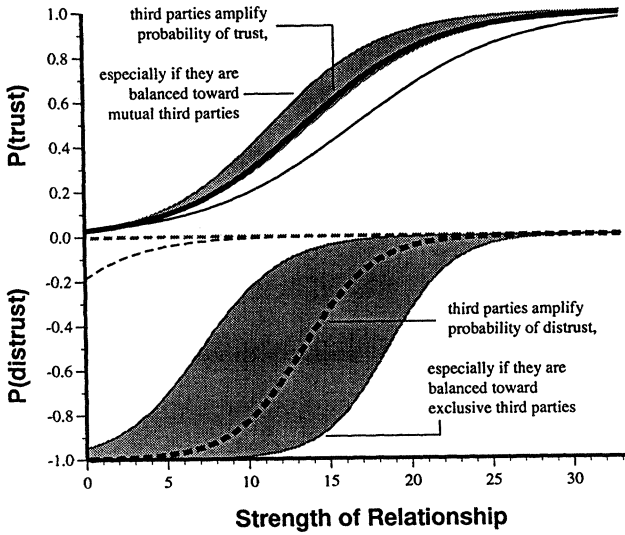
By the gossip argument, exclusive third parties should be associated with distrust because they are a more willing conduit for negative stories about alter. When ego has a positive experience with alter, mutual third parties are a receptive audience to stories about the experience because they too have a strong tie to alter. Exclusive third parties are receptive because they wish to preserve their relation with ego.

The two kinds of third parties respond differently to a negative story. Suppose ego has a negative experience with alter. Even between managers who like one another, events can create friction. Mutual friends of the two managers can be expected to blame the event. Alter is usually cooperative. Something must have been odd in this particular ego-alter interaction (see Sitkin and Roth 1993, 371ff, on attributing a trust violation to event or perpetrator). This is frustrating for ego, who is trying to discharge the irritation of bad interaction with alter by telling stories about it. How much more satisfying to speak of alter's flaws with exclusive third parties. Friends close to one manager and not the other are free to choose between blaming the event or the other manager. By the gossip argument, they will choose as ego chooses, thus reinforcing ego's choice. If ego blames the event that resulted in ego-alter friction, the exclusive third party will relay a story about a similar event. If ego blames alter, the exclusive third party will relay a story about another occasion on which alter created friction. The result of exclusive third parties being more flexible is that negative stories accumulate with them. Distrust will be easier in relationships more surrounded by exclusive third parties—which is the result in rows 9 and 10 of Table 2.

D. HOW MUTUALS COMBINE WITH EXCLUSIVES

If mutual third parties consistently increase trust and exclusive third parties consistently decrease trust, then the observed positive and negative amplification of trust at the extremes of direct connection (e.g., Figure 2) must result from a shifting balance between mutual and exclusive third parties. We studied trust across relations to see how it changed with specific mixtures of one, or two, or more mutual third parties occurring with one, or two, or more exclusive third parties (Burt and Knez 1995a). The results are summarized in Figure 5.

Figure 5 is a revision of Figure 3. The form is the same: horizontal axis is strength of direct connection, probability of trust is the top of the graph, probability of distrust is the bottom of the graph. The change is that indirect



$$P(\text{trust}) = \frac{1}{1 + e^{-f}}; \quad f = -3.553 + .213\text{DIRECT} + (.085 - .053E)(\text{STRONG} \times \text{INDIRECT})$$

(12.0) (4.9) (-1.7)

$$P(\text{distrust}) = \frac{1}{1 + e^{-f}}; \quad f = -1.476 - .324\text{DIRECT} - (.040 - .210E)(\text{WEAK} \times \text{INDIRECT})$$

(-7.4) (-1.8) (6.6)

Figure 5: Trust and distrust in mixtures of mutuals and exclusives

NOTE: Solid lines show probability of trust, dashed lines show probability of distrust, thin lines describe isolated relations (private games), bold lines describe embedded relations (public games).

connections through exclusive third parties are distinguished from connections through mutual third parties. There are now three components in the logit functions predicting trust:

$$\alpha + \beta(\text{DIRECT}) + (\gamma_v + \gamma_e E)(\text{STRONG} \times \text{INDIRECT}),$$

which disaggregates the γ indirect connection effect into two parts: γ_v is the effect of the volume of indirect connection, and $\gamma_e E$ is an adjustment for the indirect connection being balanced toward exclusive rather than mutual third parties. Variable E is a fraction measuring the extent to which exclusives outnumber mutuals around the relationship.¹⁶ The graph in Figure 5 illustrates four points that summarize our analysis.

D1. Conclusions About Aggregate Third-Party Effects

First, the two central conclusions from Figure 3 are not changed by the composition distinction between mutual and exclusive third parties. Trust still builds more slowly than distrust (slower change in the lines at the top of Figure 5 than at the bottom), and indirect connection still amplifies distrust within weak relations more than it amplifies trust within strong relations (large difference between the thin and bold dash lines at the bottom of Figure 5 versus the more similar thin and bold solid lines at the top of the figure).

D2. Composition Around Strong Relations

Second, composition matters little for third-party effects within strong relations. Both third-party effects pale in comparison to the effect of direct connection (t test = 12.0 for the .213 logit coefficient β), but the composition of third parties around strong relations is sufficiently balanced toward mutuals to make volume alone the significant third-party predictor.¹⁷ The probability of trust at the top of Figure 5 increases with indirect connections between close employees (t test = 4.9 for the .085 logit coefficient γ_v), and decreases with the extent to which the indirect connections are through exclusive third parties (t test = -1.7 for the -.053 logit coefficient γ_e). The composition effect is slight.

The modest composition effect is illustrated by the shaded area around the bold solid line at the top of Figure 5. The bold solid line describes trust in relations embedded in a median balance between mutual and exclusive third parties (median E is .56). The gray area around the bold line describes trust in relations within the interquartile range of observed balances. The bottom of the gray area is trust in relations more embedded in exclusive third parties (.73 is the 75th percentile in the E distribution). The top of the gray area is trust in relations more embedded in mutual third parties (.40 is the 25th percentile of the E distribution). Notice that the gray area is tight around the bold solid line and never much lower than the bold line. In other words, variation in the balance between mutual and exclusive third parties does not much affect trust at a given volume of indirect connection (narrow gray area), nor the difference between public games (bold line) and private games (thin line).

D3. Composition Around Weak Relations

Third, composition matters greatly for third-party effects on distrust. The probability of distrust increases in weak relationships (t test = -7.4 for the

-.324 logit coefficient β), and increases primarily with the balance toward exclusive third parties around the relationship (t test = 6.6 for the .210 logit coefficient γ_e , t test = -1.8 for the coefficient γ_v). Here, third-party effects are closer to the effect of direct connection, and the balance between mutual and exclusive third parties matters more than the volume of indirect connection.

In Figure 5, the importance of the balance between mutual and exclusive third parties is illustrated by the width of the gray area around the bold dashed line describing the probability of distrust. A balance toward exclusive third parties significantly increases the probability of distrust (bottom of gray area). A balance toward mutuals significantly reduces the probability of distrust (top of gray area). In fact, the extreme of a relation embedded in mutuals without any exclusive third parties is described by the bold, gray, dotted line in Figure 5 ($E = 0$). The dotted line shows a slight increase in distrust within near-zero relations, but can hardly be seen in the printed figure. The probability of distrust is virtually zero within strong and weak relations that are free of exclusive third parties. Between distant people, in other words, mutual third parties can substitute for a strong relation and facilitate trust. This is where their potential lies, in bringing together otherwise distant people.¹⁸

D4. Trust Potential: Probability of Trust Without Distrust

Points two and three together mean that the composition of third parties matters greatly for relations at all levels of direct connection. The fourth point in Figure 5 is that exclusive third parties increase the probability of distrust sufficiently to erode the trust potential of otherwise strong relationships. The gray area at the bottom of Figure 5 shows that exclusive third parties not only increase the probability of distrust within weak relations already sensitive to distrust, they introduce distrust into stronger relationships.

This fourth point is difficult to see in Figure 5 because it asks for a comparison between the probability of trust at the top of the graph and the probability of distrust at the bottom. The graph is complicated by the display of composition effects around both probabilities. The separate probabilities are valuable for understanding third-party effects, but it is their combination that defines the trust potential of a relationship. The issue for managers is not the probability of trust separate from the probability of distrust. It is the probability of a relationship prone to trust and free from distrust. That is the joint probability of trust and a lack of distrust—which in the simplest case is $P(\text{trust})$ from the top of Figure 5, multiplied by one minus $P(\text{distrust})$ from the bottom of Figure 5.¹⁹

The result is displayed in Figure 6. The thin line in Figure 6 describes how

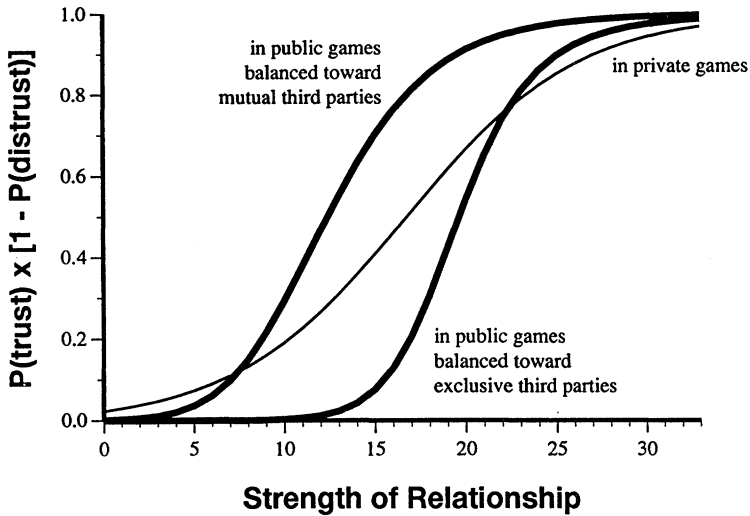


Figure 6: Probability of trust without distrust

NOTE: The 25th percentile is balanced toward mutuals, and the 75th percentile is balanced toward exclusives.

the balance between trust and distrust changes across repeated private games. This is the balance between the solid and dashed thin lines in Figure 5. The two bold lines in Figure 6 describe public games at opposite ends of the interquartile range of third-party composition in the manager data. The upper bold line compares the top of the gray areas in Figure 5 (composition balanced toward mutual third parties), and the lower bold line compares the bottom of the gray areas in Figure 5 (composition balanced toward exclusive third parties).

Both third-party conditions amplify distrust within weak relations (bold lines lie below the thin at the extreme left of the graph), and amplify trust within strong relations (bold lines lie above the thin at the extreme right of the graph). The difference between them occurs within average relations. The bold line rising above the thin line (at .08 strength relations) shows how a balance toward mutual third parties can increase the trust potential of even a moderate-strength relationship above the level expected from repeated private games, and can continue to amplify trust across stronger relationships. In contrast, the other bold line in Figure 6 stays below the thin line for all but the strongest relations. The bold line does not rise above the thin until relation strength reaches .24 (which is the strongest work relationship in these data). Given a level of trust to be expected from repeated private games between

ego and alter (thin line in Figure 6), a balance toward exclusive third parties around ego and alter makes trust almost impossible in weak- to moderate-strength relations (bold line remains near zero until relations reach .12 strength in Figure 6), and erode the trust potential of stronger relations. In sum, exclusive third parties not only increase the probability of distrust within weak relations, already sensitive to distrust, but they also erode the trust potential of otherwise strong relationships.

6. SUMMARY AND DISCUSSION

We have described how trust varies with the strength of a relationship and its location in social structure. The simplest social context for trust is an isolated dyad—two people away from others. Their interaction games are private. The more usual context is two people surrounded by various close friends, foes, and acquaintances. The two people play their games in public; a public composed of the third parties surrounding them. We argue that third-party gossip amplifies both the positive and the negative in a relationship; making ego and alter more certain of their trust (or distrust) in one another. We draw three broad conclusions from an analysis of network data on a probability sample of diverse senior managers:

1. Trust is associated with relation strength, as expected in private games. Figure 1 shows the effect for alternative meanings of a strong relationship.
2. As predicted by the gossip argument for public games, trust is significantly amplified by third parties. Third parties have a positive effect on trust within strong relations, and a negative effect on trust within weak relations. Figure 2 shows the effect, and Figure 3 shows how the probability of trust and distrust are affected by indirect connections at different levels of direct connection.
3. Different forms of indirect connection are responsible for the third-party effects on trust. Connections through mutual third parties (people close to ego and alter) are responsible for the positive effects. Connections through exclusive third parties (people closer to ego than alter) are responsible for the negative effects.

These three broad conclusions obscure significant nuances in the way that positive third-party effects interact with negative effects, but in the limited space remaining we stand back from the analysis to highlight three caveats.

First Caveat

The gossip argument allowing partial disclosure is only feasible if ego is susceptible to third parties selectively reporting information about alter. But

why doesn't ego take the third-party gossip with a grain of salt? Gossip is not known for its accuracy. This would be ego dismissing the third-party gossip as "cheap talk" (e.g., Gibbons 1992, 210ff, on cheap-talk games). Information distortions are certainly feasible within a rational choice framework (e.g., Prendergast 1993), but for the purposes of this introductory analysis, we are comfortable with a simple behavioral assumption about ego's susceptibility: Ego's prior beliefs about alter's trustworthiness are a predisposition to accept third-party gossip consistent with the prior beliefs.

Diverse kinds of evidence can be cited to justify the assumption. Prior beliefs affect how new information is processed (e.g., Hastorf and Cantril 1954; Ross and Anderson 1982). Decisions with no clear empirical referent (e.g., Is alter trustworthy?) are especially susceptible to social influence (e.g., Festinger, Schachter, and Back 1950; Pfeffer, Salancik, and Leblebici 1976; Zucker [1977] 1991; Burt 1982, 1987). How ego perceives relations with and among other people is affected by ego's personal beliefs about the relations (e.g., DeSoto 1960; Freeman, Romney, and Freeman 1987; Krackhardt 1990; Kilduff and Krackhardt 1994).

Further, ego's susceptibility is less of a problem in our analysis than it could be elsewhere. The third parties in our analysis are people that a manager cites as important to his or her work. Relations tend to be positive (72% are close or especially close). A manager might suspect individuals among these people to distort information, and the aggregate level of suspicion no doubt varies between managers, but the problem of ego dismissing gossip from these third parties as cheap talk is less than it would be with the many third parties beyond the manager's immediate network.

These justifications notwithstanding, ego's susceptibility is an important question for empirical research. We have presented evidence of strong third-party effects without any controls for personality differences between managers. Our strong results without personality controls, combined with the history of research showing personality differences in susceptibility (Lindzey and Aronson 1985) and research that links network structure to susceptibility (Gartrell 1987; Kilduff 1992), suggest to us that future research will find third-party effects to be interestingly varied across kinds of manager personalities.

Second Caveat

We have only begun the elaboration of third-party effects. Our third parties are simplistic in that they have only one motivation—to strengthen their relation with ego. They listen to stories about ego with alter. They

selectively report stories consistent with ego's view of alter. They selectively withhold stories inconsistent with ego's view.

But the third party too has a personal opinion of alter. If the third party has a bad (good) interaction with alter, then one way to punish (reward) alter is to tell ego about the interaction. Consider a less abstract setting. We happen to sit next to one another at the faculty meeting and you wax eloquent about a productive exchange you just had with professor X. I don't want to erode your obvious enthusiasm, and I enjoy being privy to your opinions, but my repeated experience with professor X is such that I wouldn't trust him to carry spit. If I behave as assumed in the preceding analysis, I am expected to communicate to you my positive experiences with professor X even though the balance of my experience is negative.

People often take the easy road of going along with the tone of the conversation, but it is obvious that third parties not only want to strengthen their relation with ego, they also want to convert ego to their opinion of alter. The third party has to make the evaluation of how far he or she can move ego's opinion of alter to the third party's opinion of alter. I dislike professor X, but in your current mood of enthusiasm for professor X, I wait to present my negative opinion and instead offer a positive platitude about X consistent with the moment. The effect on you is corroboration with your current enthusiasm—that is the substance of our gossip argument. But it is also true that I will communicate a more balanced view of professor X in the future when we are discussing an issue on which we have similar views and you have cooled down to a more neutral mood on professor X. Over time, therefore, my negative opinion of professor X is likely to infect your opinion of professor X. In other words, the asymmetry of third-party relations with ego and alter is a clue to the third party's motivation to reinforce or revise ego's opinion of alter.

There is also ego's view of the third party. A more general gossip argument would consider ego and the third party in one another's roles; the third party expressing his or her personal opinion of alter, and ego interested in relaying stories about alter that strengthen ego's relationship with the third party (e.g., network balance theory; Davis 1970). It doesn't seem likely that this more general gossip argument would yield other than our conclusion of third parties reinforcing existing relationships (because the more general model is based on the same process of players telling stories to strengthen their relations by displaying similar orientations to others). Still, the more general gossip argument remains a worthy challenge for future work.

Third Caveat

Our final caveat is about time. Our network data describe a probability sample of heterogeneous managers. That puts us in a much stronger analytical position than is characteristic in structural studies of trust, typically based on nonprobability samples or anecdotal cases. However, what makes our position strong also makes it weak in the sense that we cannot see the dynamic of trust evolving. Our data are a cross-sectional view of the managers. Our correlation between trust and structure could be due to trust emerging from structure, or structure emerging from trust, or both.

We discuss our empirical results in the causal language of our argument to present a coherent story, but argument can be made for causation in either direction. Our gossip argument has ego trust emerging from social structure. Trust between two people is encouraged or made difficult by the structure of their relations with others. On the other hand, two people who trust one another can affect the pattern of relations that develops around them. For example: From repeated interaction over time, ego develops stronger beliefs about alter's trustworthiness. Simultaneously, ego and alter develop indirect connections by continuing to be employees in the same firm. Therefore, higher levels of trust or distrust will occur with higher levels of indirect connection even though the indirect connections have no direct effect on trust.

We could also argue that causation is not the issue in our study population that it is in general for cross-sectional network data because third-party connections do not seem to evolve between managers so much as they originate elsewhere (from the broader organization context, or perhaps each manager's characteristic style of bringing third parties into relations; Burt and Knez 1995a). Third-party conditions are independent of the time for which managers have known one another. The years two managers have known each other is correlated .08 with the number of their mutual third parties, -.04 with exclusive third parties, and -.03 with their strength of indirect connection through third parties. Years known is less significant here than the manager distinction between new versus established relationships. However, the binary duration variable strongly associated with trust shows the same lack of correlation with third-party conditions (.06 with mutual third parties, -.04 with exclusive, and -.06 with strength of indirect connection).

We could argue further that causation is not the issue in our analysis that it is in general. Our analysis is less about one variable causing another, than about the general determining the particular. Trust and social structure are not two variables X and Y. They are the same variable on different scales. Trust is social structure; not all of social structure, but by definition a component of social structure. Trust is a kind of relationship, and social

structure is the network of other relations in which trust occurs. Our analysis describes how one kind of emotional closeness is associated with the network of varying close relations in which it occurs. What we have discussed as trust relations could in other circumstances be discussed as confiding, intimacy, or especially close friendship, which returns us to the problem of data. These alternative labels are possible because we do not have network data designed to measure trust.

In the end, there is no argument that transforms our data into the kind of data now needed. Third-party effects will remain ambiguous until studied under stronger control conditions with respect to time. Time should be monitored in the criterion variable. Trust is a response to exchange with time asymmetry. Our trust variable is a sociometric response to a hypothetical situation (with whom would you discuss moving to another firm). Time should be monitored in the predictor variable. The gossip argument has ego trust affected by third parties telling stories. Our network data describe the residue of working relations accumulated over time. Accurate estimates of third-party effects require knowing when third-party stories are relayed to ego and ego's willingness to trust alter before and after receiving the stories. There are numerous variables in that sentence. It is not clear that the third-party effects are triggered by the story received, or the aggregate of stories received, or the concentration of stories in a brief period of time—all of which is the challenge for future work.

NOTES

1. The full disclosure argument can be stated in terms of full information. No individual knows everyone else. Indirect connections between ego and alter provide alternative communication channels and so increase the probability that ego is fully informed about alter's past behavior. Fully informed means that ego is more certain of his or her trust in alter. Whether the stories relayed through indirect connections improve ego's information on alter, or give ego a feeling of vicarious play in repeated games with alter, the end result is the same—ego is more certain of his or her trust in alter.

2. The step from full disclosure to partial disclosure introduces the complication of predicting what is disclosed and what is not disclosed. We make two key assumptions for this introductory analysis: (a) Ego, accustomed to using third parties as background informants on other people, is similarly affected by full and partial disclosure third-party stories about alter; (b) third parties, to sustain and strengthen their relation with ego, are more likely to disclose to ego experiences with alter that are consistent with ego's opinion of alter. We make these assumptions because we believe they are by and large correct, and our principal analytical concern is to establish third-party effects, postponing for future research the task of elaborating how third-party effects vary across (a) managers varying susceptible to third-party gossip, and (b) third parties who selectively communicate stories consistent with ego's opinion of alter, and strategically communicate stories to revise ego's opinion to be more consistent with the third

party's opinion. We return to these issues at the end of the article.

3. Although not directly concerned with trust, two lines of work describe a dark side to network density relevant to our analysis of trust. One concerns the extent to which a person is subject to the social pressure of interpersonal influence and sanctions. With interpersonal influence stronger within dense networks, it is easier to impose sanctions within a dense network. This is the subject of a rich literature in political science and sociology, but Coleman's (1990, chap. 11) analysis of social norms is a rational choice exemplar. Small (incremental) sanctions within a dense network can aggregate to a large effect (e.g., pp. 278ff on negative reputation, and pp. 284ff on gossip facilitating sanctions by creating or clarifying norms). If distrust is the emotion that accompanies sanction, then dense networks, by intensifying sanctions, intensify distrust. So viewed, our positive and negative density effects on trust merely combine and give functional form to what Coleman has already analyzed, but as separate phenomena; trust strengthened within dense networks and sanctions strengthened within dense networks.

Network theories of competition are a second caveat to our statement about the neglect of density's dark side. Reversing the concerns of the work just described, this line of work concerns the extent to which a person can negotiate the social pressure of interpersonal influence and sanctions. Building on Simmel's ([1922] 1955) and Merton's ([1957] 1968) analyses of conflicting affiliations, network theories of competition describe the information and control advantages of building relations with contacts in disconnected groups (e.g., Burt 1992, 30-6, on structural holes and entrepreneurs). Sparse networks provide broader information access and more opportunities to control exchange relations. Illustrations are Cook and others' (1983) experiments showing how resources accumulate to people at the crossroads in networks, Krackhardt and Stern's (1988) experiments showing higher group performance with cross-group friendships, or Burt's (1992) and Podolny and Baron's (1994) manager surveys showing the promotion advantage of having strong connections to otherwise disconnected groups. Direct application to trust production implies that successful managers build trust in private games (maintaining a sparse network of nonredundant contacts), while less successful managers find themselves in public games (which results in a dense network of mutual friends). Results on the managers studied here are interestingly more complex and available elsewhere (Burt and Knez 1995a).

4. Lindenberg and Frey (1993) discuss more general parameters in ego's rational choice of frame. Our argument is that ego's frame on alter, whatever it is, is reinforced in conversations with third parties. This alleviates the monitoring problem that Hechter (1987; 1990, 243-4) highlights in his argument about dependence and formal control being necessary conditions for group solidarity. Hechter (1987, 73-7) takes issue with Axelrod's (1984, chap. 4) use of the live-and-let-live system of trench warfare to illustrate the idea that cooperation emerges in even the most difficult circumstances if players anticipate future interaction with one another. Hechter stresses the implicit monitoring necessary to the live-and-let-live system, the difficulty of monitoring even between the two armies, which is analogous to a two-player game, and the implausibility of that monitoring (without formal controls) in games of more than two players. In other words, cooperation is more difficult in larger groups. Hechter's argument presumes the perfect information condition that everyone monitors everyone else, whereupon monitoring is more difficult in larger groups. The gossip argument is less demanding. Everyone is relatively ignorant, but increasingly informed by third parties with increasing indirect connection. All it takes is one third party to relay stories between a pair of people. Systemic properties of amplified trust and distrust emerge from the microsocial context around individual pairs of people. The monitoring problem reduces to realistic proportions. The whole population does not monitor your behavior, just your closest friends and co-workers (cf. Janowitz and Shils [1948] 1991, on why the German Wehrmacht continued to function despite repeated defeats during World

War II—monitoring was between buddies in the squad, and the army was a system of interlocked squads).

5. Let z_{ij} be the intensity of closeness between persons i and j , scaled from the response categories describing relations with and among manager contacts (Burt 1992, 125-6). The proportional strength of manager i 's relation with contact j (p_{ij}) is z_{ij} divided by the sum of the manager's relations ($\sum_q z_{iq}$). The indirect connection between manager i and contact j is measured as in the original study by the proportion of a manager's network that leads through intermediaries q back to contact j ($\sum_q p_{iq} p_{qj}$, $q \neq i, j$). We multiply the proportional strength measures by 100 to discuss points of change. Direct connection varies from 1 to 25 points with a mean of 7.9, and indirect connection varies from 0 to 32 points around a mean of 11.7 points. To create the dichotomy between little and much indirect connection for Figure 2, we graphed probabilities of trust and distrust across levels of indirect connection. Cutting the data where the lines of trust and distrust cross, we treat less than 15 points of indirect connection as little and above that as much. This justifies our cut point between much and little indirect connection by the shift in its effect on trust. We also ran the analysis with slightly higher and lower cut points, and obtained the same results. We do not want to make too much of the little-much distinction. The point introduced in Figure 2 is supported by the results in Table 1 with continuous measures of indirect connection.

6. Unless you have no future in the firm. The citations to people for job option discussions could be from managers so unhappy in the firm, or so unsuccessful, that they have nothing to lose by talking about moving to another firm. This does not seem to be the case. First, most managers have someone they would turn to. All but three managers cite contacts with whom they would discuss job options. Only 22 limit that discussion to contacts outside the firm. Second, there is no tendency for satisfied or successful managers to cite fewer contacts. Satisfaction is uncorrelated with number of people cited for job option discussion (.02 correlation). Managers are distinguished in Burt (1992, 126-31) by the extent to which they were promoted early to their current job. This measure of manager success, strongly correlated with network structure, has no correlation with the number of people cited for job option discussion (.05 correlation).

7. Two potential complications turn out to be minor in these data: (a) the assumed equal intervals between trust, neutral, and distrust, and (b) managers who cite a person for both trust and distrust. On issue (b), seven contacts are cited for trust and distrust and the circumstances vary. The one thing consistent across the seven trust-distrust relations is extensive indirect connections. The manager did not trust the contact, but would have to let him know about plans to move to another firm. Taking the distrust component more seriously, we assign the seven trust-distrust relations to the distrust category. This seems a minor issue because we get the same pattern of t tests in Table 1 if the seven trust-distrust relations are coded as trust relations, or neutral relations. Discriminant analysis provides a more sophisticated solution to issues (a) and (b). The discriminant function is the linear combination of the four network variables in Table 1 that best predicts two dependent variables: trust and distrust. There is no assumption that the trust-neutral interval equals the interval between neutral and distrust because separate effects are estimated for trust and distrust. The seven trust-distrust relations remain as trust relations in the trust variable and distrust relations in the distrust variable. Most of the effect variation is captured in the first discriminant function (.53 canonical correlation, 82% of the covariance described by the two canonical correlations). Because there is so little overlap between trust and distrust, however, not much is gained with discriminant analysis. The discriminant function scores are correlated .985 with scores for the three-category trust variable predicted from the regression model in Table 1. The Table 1 regression model is simpler, easier to use for significance tests, and yields predictions almost identical to the more sophisticated discriminant

function model. We use the Table 1 regression model, but note that collapsing trust and distrust into a single variable will not be reasonable in all study populations.

8. Trust and distrust are extremely skewed binary dependent variables: 791 of the 3,584 contacts are cited for trust, and only 263 are cited for distrust. Logit results for the continuous variables in Table 1 yield the same relative magnitudes of test statistics for trust (t test = 12.3 for direct connection, t test = 7.8 for indirect connection around strong relations), and similar test statistics for distrust (t test = -10.6 for direct connection, t test = 2.6 for indirect connection around weak relations; and see Burt and Knez 1995b, tab. 1, for similar log-linear results). We focus on ordinary least squares (OLS) results in the text because the metric regression coefficients are more likely familiar to readers, and we reach the same conclusions with logit results. The results for the "combined" variable in Table 1 are valuable because we can take advantage of the ordering between trust and distrust responses to create a less skewed criterion variable more appropriate for OLS estimators.

9. We have 3,584 relationships elicited from 284 managers. The effect estimates are based on the assumption that each relation is an independent observation. The managers are a probability sample, but their relationships are a cluster probability sample (each manager's network a cluster). If relations are autocorrelated within clusters, the number of independent observations is less than 3,584 and test statistics based on dyad counts are exaggerated. We reestimated the equations predicting the three-category trust variable, adding 283 dummy variables to distinguish managers. There is autocorrelation, but it is concentrated in a minority of managers. There are 70 managers whose dummy variable increases or decreases trust by more than one point. The weakest of these is quite negligible (t test = 0.1). We get the bracketed t tests in Table 1 when dummy variables for all 70 managers are included in the model.

10. The displayed logit equations contain effects estimated from the data in Table 1 on relations within the firm. The effects are significant (t tests = 12.1 and 5.9 for trust equation, t tests = -10.4 and 2.3 for distrust equation; cf. Note 8 for similar tests when effects are estimated from relations within and beyond the firm). To generate the probability of trust and distrust between isolated pairs of people (thin lines in Figure 3), we computed probabilities with INDIRECT set to zero, which means the interaction term drops out of each logit equation (leaving a single predictor, DIRECT, which is $100p_{ij}$). To illustrate amplification through indirect connections (bold lines in Figure 3), (a) we do not know whether relations are especially close or less close, so we let STRONG and WEAK be a continuous function of relation strength (STRONG = p_{ij} , WEAK = $1 - p_{ij}$), and (b) we set indirect connection to the maximum possible given the proportion of a manager's network allocated to direct connection (INDIRECT = $100 - 100p_{ij}$).

11. Social structure's different associations with the positive and negative in Figure 3 are suspicious. The different functional forms are consistent with the different measurement criteria in these data. Trust is measured with a criterion of discussing job options. Distrust is measured with a more severe criterion of naming the manager's most difficult co-worker. Tests with more severe trust criteria merely shift the gradually increasing trust function to stronger relations (Burt and Knez 1995b, fig. 3). In other words, the different functional forms for trust and distrust in Figure 3 are not created by the different criteria for positive and negative relationships.

12. There is also the issue of whether emotional closeness should be measured in terms of absolute rather than relative closeness. A proportional strength of .1 could be from a manager especially close to 10 contacts, or less close to 10 contacts. To test for volume, we added the sum of a manager's relations—the denominator for the proportional strength measure—to the all-dyad equation predicting three-category trust in Table 1. Trust is slightly more likely from managers with a higher volume of emotional closeness (t test = 2.3), but the effect disappears when autocorrelation is held constant (t test = 1.7, see Note 9).

13. Strong relations emerge from frequent contact. The more often you bump into the same person in your neighborhood, at social functions, in meetings, the more likely you will eventually say hello and come to know one another. Friendships develop. The process is enhanced by the increased chances that you know some of the same people at these places, which further increases the chances of meeting one another with things in common. Festinger, Schachter, and Back's (1950) study of physical proximity effects on friendship patterns remains the classic empirical study (with Homans 1950, the related theoretical work). Feld's (1981, 1982) analysis of social foci generalizes the process by linking it to homophily—people with similar socially significant attributes (occupation, age, etc.) are likely to bump into one another in the same places and have mutual friends in those places. We find no evidence of frequency affecting trust above and beyond the factors in Table 1. Figure 1 shows that trust is more likely between people who meet frequently, and distrust more likely when people rarely meet, but the significant zero-order association between contact frequency and the three-category trust variable in Table 1 (t test = 9.7), is negligible after direct and indirect closeness are held constant (t test = 0.1 for frequency when added to the equation in the last column of Table 1).

14. The data distinguish four levels of manager-contact closeness, three levels between the contacts. Quantitative scores given the levels with an association model of the data make it easy to define relations for Figure 4 (Burt 1992, 287-8). From the manager (ego to third parties), bold lines are especially close or close relationships (closeness scores z_{ij} of 1.0 or .69), and dashed lines are less close or distant relations (z_{ij} of .36 or .01). Between cited contacts (alter and the third parties), bold lines are especially close relations (z_{ij} of 1.0), dashed lines are close (z_{ij} of .34), and missing lines are between people who "do not enjoy one another's company, finding it unpleasant to be together or work together" (z_{ij} of 0.0).

15. To learn more about the people who play each third party role, we recomputed the counts of third parties. Instead of counting third parties between manager and alter, we counted the number of times that alter played each third-party role with respect to each of the manager's other contacts. With these data, we can study the kinds of relations managers have with each kind of third party (see Burt and Knez 1995a, for log-linear results). The two kinds of mutual third parties come from different places. TP1 mutuals are most often contacts outside the firm or colleagues with whom the manager discusses important personal matters and frequently gets together for informal lunch, dinner, home visits, and so on. TP2 mutuals are in the manager's network because they are the manager's boss or essential sources of support for projects.

16. Variable E is the probability that a randomly selected third party to the relationship is exclusive and not mutual: $E = PE(1 - PM)$, where PE is the proportion of third parties around a relationship that are exclusives, and PM is the proportion mutuals (see Burt and Knez 1995a, for detailed analysis of E in terms of the ambient heat of a relationship). For example, consider the relation between one of the managers, call him John, and his boss. John cites 14 important contacts, so there are 13 indirect connections to the boss through other contacts. The 13 indirect connections are 10 through people close to John and the boss, 1 through someone distant from John and his boss, and 2 through people closer to John than his boss. John's relationship with his supervisor is embedded in 77% mutual third parties (10/13) and 15% exclusive third parties (2/13). The balance is away from exclusive third parties (E is .03).

17. Balance toward exclusive third parties is significantly lower around especially close relations than around close, less close, and distant relations (t test = -7.7 for mean E in especially close vs. other).

18. This potential animates the facilitator role of consultants. An outsider trustworthy to two groups is brought in to help the two groups cooperate. Sabel's (1993) concept of studied trust is a useful illustration we elaborate elsewhere (Burt and Knez 1995a; cf. Perrow 1992, 461, on network conditions for trust production). The examples also illustrate the importance of having

the newly cooperative people take over their cooperative relations as they build in strength. The mutual third party is like the first-stage rocket launching a space vehicle—critical for getting the thing off the ground, best discarded soon thereafter.

19. The product is the joint probability if trust and distrust are independent. We do not believe they are (although there could be an analogy to independent positive and negative affect; Bradburn 1965). The probability of trusting someone is likely contingent on whether there is any reason to distrust the person. This is a subtlety for future research. Joint probability under independent trust and distrust is sufficient to illustrate the points we wish to make here.

REFERENCES

- Axelrod, Robert. 1984. *The evolution of cooperation*. New York: Basic Books.
- Barber, Bernard. 1983. *The logic and limits of trust*. New Brunswick: Rutgers University Press.
- Blau, Peter M. 1964. *Exchange and power in social life*. New York: Wiley.
- . 1968. Interaction: Social exchange. In *The international encyclopedia of the social sciences*, edited by David L. Sills. New York: Free Press and Macmillan.
- Bradach, Jeffrey L., and Robert G. Eccles. 1989. Price, authority, and trust: From ideal types to plural forms. *Annual Review of Sociology* 15:97-118.
- Bradburn, Norman. 1965. *Reports on happiness*. Chicago: Aldine.
- Burt, Ronald S. 1982. *Toward a structural theory of action*. New York: Academic Press.
- . 1987. Social contagion and innovation: Cohesion versus structural equivalence. *American Journal of Sociology* 92:1287-335.
- . 1990. Kinds of relations in American discussion networks. In *Structures of power and constraint*, edited by Craig Calhoun, Marshall W. Meyer, and W. Richard Scott, 411-51. New York: Cambridge University Press.
- . 1992. *Structural holes: The social structure of competition*. Cambridge: Harvard University Press.
- Burt, Ronald S., and Norm Celotto. 1992. The network structure of management roles in a large matrix firm. *Evaluation and Program Planning* 15:303-26.
- Burt, Ronald S., and Marc Knez. 1995a. Trust and third parties: The social production of cooperation. Unpublished manuscript, Graduate School of Business, University of Chicago.
- . 1995b. Trust and third-party gossip. In *Trust in organizations*, edited by Rod Kramer and Tom Tyler. Thousand Oaks, CA: Sage.
- Coleman, James S. 1990. *Foundations of social theory*. Cambridge: Harvard University Press.
- Cook, Karen S., Richard M. Emerson, Mary R. Gillmore, and Toshio Yamagishi. 1983. The distribution of power in exchange networks: Theory and experimental results. *American Journal of Sociology* 89:275-305.
- Davis, James A. 1970. Clustering and hierarchy in interpersonal relations: Testing two graph theoretical models on 742 sociograms. *American Sociological Review* 35:843-52.
- DeSoto, Clinton B. 1960. Learning a social structure. *Journal of Abnormal and Social Psychology* 60:417-21.
- Ekeh, Peter P. 1974. *Social exchange theory*. Cambridge: Harvard University Press.
- Feld, Scott L. 1981. The focused organization of social ties. *American Journal of Sociology* 86:1015-35.
- . 1982. Social structural determinants of similarity. *American Sociological Review* 47:797-801.

- Festinger, Leon, Stanley Schachter, and Kurt W. Back. 1950. *Social pressures in informal groups*. Stanford: Stanford University Press.
- Freeman, Linton C., A. Kimball Romney, and Sue C. Freeman. 1987. Cognitive structure and informant accuracy. *American Anthropologist* 89:310-25.
- Gartrell, C. David. 1987. Network approaches to social evaluation. *Annual Review of Sociology* 13:49-66.
- Gibbons, Robert. 1992. *Game theory for applied economists*. Princeton: Princeton University Press.
- Granovetter, Mark S. 1985. Economic action, social structure, and embeddedness. *American Journal of Sociology* 91:481-510.
- . 1992. Problems of explanation in economic sociology. In *Networks and organization*, edited by Nitin Nohria and Robert G. Eccles, 25-56. Boston: Harvard Business School Press.
- Hardin, Russell. 1990. The social evolution of cooperation. In *The limits of rationality*, edited by Karen S. Cook and Margaret Levi, 358-78. Chicago: University of Chicago Press.
- Hastorf, A. H., and H. Cantril. 1954. The saw game: A case study. *Journal of Abnormal and Social Psychology* 49:129-34.
- Hechter, Michael. 1987. *Principles of group solidarity*. Berkeley: University of California Press.
- . 1990. On the inadequacy of game theory for the solution of real-world collective action problems. In *The limits of rationality*, edited by Karen S. Cook and Margaret Levi, 240-9. Chicago: University of Chicago Press.
- Homans, George C. 1950. *The human group*. New York: Harcourt, Brace and World.
- . 1961. *Social behavior: Its elementary forms*. New York: Harcourt, Brace and World.
- Ibarra, Herminia. 1992. Homophily and differential returns: Sex differences in network structure and access in an advertising firm. *Administrative Science Quarterly* 37:422-47.
- . 1994. Untangling the web of interconnections: Pragmatics of gender differences in managerial networks. Harvard University Graduate School of Business Working Paper No. 93-044.
- Janowitz, Morris, and Edward A. Shils. [1948] 1991. Cohesion and disintegration in the Wehrmacht in World War II. In *On social organization and social control*, edited by James Burk, 160-75. Chicago: University of Chicago Press.
- Kanter, Rosabeth M. 1984. *The change masters: Innovation and entrepreneurship in the American corporation*. New York: Simon & Schuster.
- Kilduff, Martin. 1992. The friendship network as a decision-making resource: Dispositional moderators of social influences on organizational choice. *Journal of Personality and Social Psychology* 62:168-80.
- Kilduff, Martin, and David Krackhardt. 1994. Bringing the individual back in: A structural analysis of the internal market for reputation in organizations. *Academy of Management Journal* 37:87-108.
- Krackhardt, David. 1990. Assessing the political landscape: Structure, cognition, and power in organizations. *Administrative Science Quarterly* 35:342-69.
- Krackhardt, David, and Robert N. Stern. 1988. Informal networks and organizational crisis: An experimental simulation. *Social Psychology Quarterly* 51:123-40.
- Kreps, David M. 1990. Corporate culture and economic theory. In *Perspectives on positive political economy*, edited by J. Alt and Kenneth Shepsle, 90-143. New York: Cambridge University Press.
- Larson, Andrea. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly* 37:76-104.

- Lindenberg, Siegwart, and Bruno S. Frey. 1993. Alternatives, frames, and relative prices: A broader view of rational choice theory. *Acta Sociologica* 36:191-205.
- Lindzey, Gardner, and Elliot Aronson, eds. 1985. *Handbook of social psychology*. Vol. 2, *Special fields and applications*. New York: Random House.
- Merton, Robert K., ed. [1957] 1968. Continuities in the theory of reference group behavior. In *Social theory and social structure*. New York: Free Press.
- Nohria, Nitin, and Robert G. Eccles, eds. 1992. *Networks and organizations*. Boston: Harvard Business School Press.
- Perrow, Charles. 1992. Small-firm networks. In *Networks and organizations*, edited by Nitin Nohria and Robert G. Eccles, 445-70. Boston: Harvard Business School Press.
- Pfeffer, Jeffrey, Gerald R. Salancik, and H. Leblebici. 1976. The effect of uncertainty on the use of social influence in organization decision-making. *Administrative Science Quarterly* 21:227-45.
- Podolny, Joel M., and James N. Baron. 1994. Make new friends and keep the old?: Social networks, mobility, and satisfaction in the workplace. Unpublished paper, Graduate School of Business, Stanford University.
- Powell, Walter W., and Laurel Smith-Doerr. 1994. Networks and economic life. In *The handbook of economic sociology*, edited by Neil J. Smelser and Richard Swedberg, 368-402. Princeton: Princeton University Press.
- Prendergast, Canice. 1993. A theory of "yes men." *American Economic Review* 83:757-70.
- Ross, Lee, and Craig A. Anderson. 1982. Shortcomings in the attribution process: On the origins and maintenance of erroneous social assessments. In *Judgment under uncertainty: Heuristics and biases*, edited by Daniel Kahneman, Paul Slovic, and Amos Tversky, 129-52. Cambridge: Cambridge University Press.
- Sabel, Charles F. 1993. Studied trust: Building new forms of cooperation in a volatile economy. In *Explorations in economic sociology*, edited by Richard Swedberg, 104-44. New York: Russell Sage.
- Simmel, Georg. [1922] 1955. *Conflict and the web of group affiliations*. Translated by K. H. Wolff and R. Bendix. New York: Free Press.
- Sitkin, Sim B., and Nancy L. Roth. 1993. Explaining the limited effectiveness of legalistic "remedies" for trust/distrust. *Organization Science* 4:367-92.
- Smelser, Neil J., and Richard Swedberg, eds. 1994. *Handbook of economic sociology*. Princeton: Princeton University Press.
- Stinchcombe, Arthur L. 1990. *Information and organizations*. Berkeley: University of California Press.
- Swedberg, Richard, ed. 1993. *Explorations in economic sociology*. New York: Russell Sage.
- White, Harrison C. 1992. *Identity and control*. Princeton: Princeton University Press.
- Zucker, Lynne G. [1977] 1991. The role of institutionalization in cultural persistence. In *The new institutionalism in organizational analysis*, edited by Walter W. Powell and Paul J. DiMaggio, 83-107. Chicago: University of Chicago Press.
- . 1986. Production of trust: Institutional sources of economic structure, 1840-1920. *Research in Organizational Behavior* 8:53-111.