

GUANXI AND STRUCTURAL HOLES: STRONG BRIDGES FROM RELATIONAL EMBEDDING¹

December, 2023

Ronald S. Burt, Bocconi University and University of Chicago (rburt@uchicago.edu)

Sonja Opper, Bocconi University (sonja.opper@unibocconi.it)

We highlight a kind of relationship that is familiar, consequential for network predictions of performance — and consistent with, but not yet distinguished in, network theory. Phrased in terms of network theory, the Chinese term “*guanxi*” can be viewed as a tie that has become strong through its history such that trust within the relationship is high and independent of the surrounding network. As such, a *guanxi* tie can function on its own as a strong bridge between groups, bypassing the need for structural embedding in third parties. We use interviews with a stratified probability sample of Chinese business leaders to look for pattern in the ways they use the term *guanxi*, and the performance relevance of relations they designate *guanxi*. The discussion positions *guanxi* within network theory to improve predictions, and facilitates unambiguous discussion of *guanxi*-like relations as a concept in the theory.

A meritocracy is widely understood to be a governance system that distributes resources in proportion to merit. Such systems, so worthy of aspiration, are typically noted for their absence. Familiar barriers to a practical meritocracy include accidents of birth, friends, ignorance, love of one's own kind, obligations, quotas, sloth — it is a long list. The inevitable gap between aspiration and practice generates frustration and anger. So it is not surprising that people in diverse cultures have a word for relationships that provide a way around meritocracy to offer individual advantage; a

¹The authors are grateful for financial support from the Jan Wallanders and Tom Hedelius Stiftelsen. Professor Burt is grateful to Bocconi University and the University of Chicago Booth School of Business for financial support during the work reported here. Professor Opper is grateful to Riksbankens Jubileumsfond for her sabbatical grant, and to the Center for East Asian Studies at the University of Chicago for hosting her as an Associate. The manuscript has benefited from Na Zou's research assistance, presentations at Dartmouth College, the University of Chicago, Bocconi University, the 10th Anniversary Conference of Xi'an Jiaotong University's Institute for Empirical Social Science Research, the 2023 annual meetings of the Academy of Management, and helpful comments in particular from Yanjie Bian, Adam Kleinbaum, Nan Lin, Jie Ren, Na Zou, and all three AJS reviewers. The network instrument in English is available at www.ronaldsburt.com.

manifestation of insider wisdom when you are the one advantaged, an indicator of corruption when someone is advantaged over you: *dedazo* in Spanish, *guanxi* in Chinese, *piston* in French, *protektsiya* in Russian, *raccomandazione* in Italian, *vitamin b* in German, *yongo* in South Korean, *wasta* in Egyptian.

This category of colloquial words is a playground for social network theory. Theory defines social mechanisms responsible for the referenced advantage. Half a century of work on social networks has settled on bridge relations as the source. A relationship is a bridge when it connects people who are otherwise not connected — typically a person in this group connected to a person in that other group. More precisely, the lack of connection between two groups is a hole in social structure, a structural hole, and relations are a bridge when they connect across a structural hole. In theory, information advantages of breadth, timing and arbitrage increase with the extent to which a person is rich in opportunities to bridge structural holes. Granovetter (1973), Burt (1992), and Lin (2001) are core sources, with a burgeoning research corpus detailing the competitive advantage of network brokers arbitraging information across groups (reviews from various perspectives in Burt 2005, 2019, 2021; Stovel and Shaw 2012; Halevy, Halali, and Zlatev 2019; Kwon et al. 2020; Brass 2022; van Burg, Elfring, Cornelissen 2022). Looking further back in time, today's network brokers correspond to Burns and Stalker's (1961) image of managers in an "organic" organization, Katz and Lazarsfeld's (1955) "opinion leaders," Merton's (1949; Goldner 1957) "cosmopolitans," and more distantly, Schumpeter's (1911) and Hayek's (1937, 1945) touchstone images of what it means for a person to be an entrepreneur.

Coincident with the evidence of bridge relations being consequential for individual achievement is evidence of fragility. Network bridges are "weak" (Granovetter 1973, 1982). They are prone to decay (Burt 2002, 2005, pp.197-208; Martin and Yeung 2006; Samila, Oetti, and Hansan 2021). Brokerage is fragile (Buskens and van de Rijt 2008; Stovel, Golub, and Milgrom 2011).

A solution is to reinforce bridges with third parties strongly connected to the individuals at either end of the bridge, thereby creating a closed-triad "Simmelian tie" (Krackhardt 1992, 1999; Tortoriello and Krackhardt 2010), or a "wide bridge" (Centola and Macy 2007; Centola 2018; Guilbeault and Centola 2021). Aggregating up, Stovel et al. (2011) discuss examples of brokerage stabilized by embedding it in an institution: Brokerage can be made less fragile by confining it to a group that

cannot abuse broker information advantage (e.g., marriage matchmakers in China), absorbing brokers into one side or the other (e.g., Protestant missionaries supporting practical community interests rather than colonial elite interests), or absorbing brokerage into the activity of an established organization (e.g., social welfare organizations that foster brokerage among members).

The conditions reinforcing bridge relations are familiar in theory, and can be supported empirically, but they are primarily strategies for converting brokerage into closure. Adding third parties eventually converts a bridge between groups into a structurally embedded relationship within a group. Third-party reinforcement has several attractive features discussed in the above references, especially for loosely-connected networks across the internet. But for the general case, which includes unambiguously balkanized networks within and across organizations, we find third-party reinforcement a theoretically unsatisfactory solution to the fragility of bridge relations. Alternative solutions must exist: Despite ostensible fragility, brokerage somehow persists in the disequilibrium of new structural holes detected as familiar holes close (Burt 2005, Chp. 5; Quintane and Carnabuci 2016).

Our alternative story finds bridge strength in the history of individual relationships. This story has its own limitations (to which we return at the end of the paper). It is also no surprise. Beyond the many stories in fiction and fact about relationships shaped by their history, Granovetter (1992) distinguishes “relational” from “structural” embedding in reconsidering his (1985) discussion in this journal of embedding as a general phenomenon, Kollock (1994) in this journal discusses the critical value of events that establish trust in a relationship (cf., Dahlander and McFarland 2013 on collaborations persisting with positive past experience), and Quintane and Carnabuci (2016) report that brokerage among long-term contacts is different from brokerage among short-term contacts.

Our goal is to build on these ideas to sketch a reliable, consequential, and empirically verified place in network theory for historically-grounded relations. We study network data on Chinese business leaders and what they perceive to be their *guanxi*. *Guanxi* ties emerge in the analysis as relations embedded in a positive history such that trust and cooperation are high and relatively independent of structural embedding. As such, *guanxi* can overlap with the more familiar strong ties embedded in third parties. The key point is that as such, *guanxi* can be strong

bridges — a portal for cooperation and trust across structural holes. We offer empirical evidence of them serving just such a function.

What follows is a template for a kind of analysis. The network-advantage words in our opening paragraph (and kindred words in other cultures) could each be the subject of similar analysis. Our sense is that more precise, reliable understanding would come from connecting those words with specific network locations in each culture, as we do here for *guanxi*. Those analyses could then be a lens on how network advantage is understood in different cultures. For example, compare relations perceived as *guanxi* in China, to the relations viewed as *piston* in France, to the relations viewed as *vitamin b* in Germany. Given the results to be reported on *guanxi*, we suspect analysis in each culture would link advantage to bridge relations.

Our discussion is in five parts. We begin by collecting the many proposed meanings of *guanxi*, then propose hypotheses locating *guanxi* within social network theory. Mindful of the value to network theory of its ability to predict achievement, we hypothesize that the strong-bridge properties of *guanxi* ties should make them a significant component in network predictions of business performance. In the third section, we introduce the data and methodology. In the fourth section, we present our results, which integrate and align the performance effects of *guanxi* with empirical studies of network brokers. The results highlight a role for *guanxi* that is distinct from the role of strong ties more generally. In the fifth section, we close discussing implications for network theory and research.

TOO MANY MEANINGS

A feature of the interface between social science and colloquial language is that a word often used is a word rarely used in a consistent way. *Guanxi* is such a word. Broadly understood to be a valuable, particularistic relationship (Tsui and Farh 1997; Chen and Chen 2004; Chen, Chen, and Huang 2013), *guanxi* is a word easy to find used in diverse ways (review in Bian 2019; Nolan and Rowley 2020). At the time we wrote this, our search for the term *guanxi* in the Web of Science database generated 2,604 academic works, two-thirds of which were in business, economics, or management. Search for a consistent definition is quickly mired in ambiguity and controversy. There are Hwang's (1987) metaphors for the existence and use of *guanxi*. There are analogies to family ties and obligations (Fei 1992[1947]; Yang

1994; Bian 2018, 2019). There are Confucian concepts of self and society (Yang 1994; Yeung and Tung 1996; Bian 2019; Dunning and Kim 2007). Others have emphasized the reciprocal nature of exchange relations incorporating enduring traditions of favor bestowing and gift giving (Yang 1994) with sentimental (Fei 1992[1947]; Lin 2001, 2017; Yang 1994; Bian 2018, 2019) or moral (Tsui and Farh 1997) connotations. There is also an instrumental notion of favoritism (Walder 1986; Guthrie 1998; Lin 2017) sliding into corrupt activities, such as bribery and collusion (Fan 2002; Luo 2008). Other conceptions include *guanxi* circles (Luo, Cheng, and Zhang 2016; Bian and Shuai 2019), Bian's (2018) five levels of *guanxi*, and Li et al.'s (2019) "multicolored Chinese knot." There are etymological stories about linguistic roots distinguishing *guan* from *xi* from *bao* from *renqing*. The only broad agreement is that *guanxi* is a kind of relationship (Li and Xie 2019), commonly perceived as unique enough to refer to the romanized term *guanxi* (关系), rather than translations such as "relations" or "relationships" in common parlance, or "strong ties" in network theory.

Within the organizations literature, two perspectives are readily distinguished, largely insulated from one another. The first consists of culturally inspired work highlighting relational strategies in which *guanxi* is understood as a unique, interpersonal relationship and strategy (Xin and Pearce 1996; Tsui and Farh 1997; Guthrie 1998; Peng and Luo 2000). The common narrative running through this literature is that companies and individuals with *guanxi* and associated strategies can realize financial and market benefits when accessing scarce resources, such as capital, land, or skilled labor as well as administrative services (Peng and Luo 2000; Park and Luo 2001; Luo, Huang, and Wang 2011; Nee and Opper 2010, 2012; Opper, Nee and Holm 2017). Similarly, *guanxi* may offer advantages in securing legal protection and varying forms of politically motivated preferential treatment in the presence of weak and unpredictable formal institutions (Peng and Luo 2000; Park and Luo 2001; Luo 2003; Li, Poppo, and Zhou 2008; Luo et al. 2011). There is ample cumulative evidence highlighting the value of *guanxi* (overview in Chen et al. 2013). However, the focus on China's specific business context has impeded cultural comparisons, including a search for similar dyads across different cultural contexts (for some exceptions, see Chua, Morris, and Ingram 2009; Burt 2019; Burt and Batjargal 2019). Similarly, an emphasis on relational qualities and performance

outcomes has largely obscured the question of *where* managers might find productive *guanxi* ties within their social networks.

In the second perspective, typical of social network research, scholars avoid explicit operationalization of Chinese *guanxi*. Work in this perspective is focused on testing the validity of the network-performance hypothesis — a negative association predicted between network closure and performance, innovation, and creativity — which is widely observed in the West (critique and review in Kwon et al. 2020; Burt 2021; Tasselli and Kilduff 2021; Brass 2022). With few exceptions, the majority of studies focusing on Chinese firms and their managers confirm a negative association between closed networks and business success (Batjargal 2007a, 2007b, 2010; Batjargal et al. 2013; Burt and Burzynska 2017; Burt 2019; Zhao and Burt 2018; Burt, Opper, and Zou 2021).

Nevertheless, skepticism remains, and cultural contingency arguments persist, raising their barrier to synthesis across the two perspectives. Can open networks really be productive in a cultural context in which *guanxi* is highly valued? Mitigating such concern is difficult, given stark methodological and aspirational differences between the usual *guanxi* versus social network analysis. Yet both sides could benefit from integrative bridges. It would be reassuring for network scholars to explore the nature of relations to validate the network-performance association controlling for *guanxi* ties. *Guanxi* scholars, in turn, would benefit from an analytically tractable (and hence replicable) definition of *guanxi*. Finally, locating *guanxi* within ego-centered networks offers a strategy to distinguish between culturally-contingent and universal social mechanisms, which is likely to facilitate cross-cultural work.

A critical step forward is to cut through the intellectual briar patch surrounding the semantic question of what is and what is not *guanxi*, and determine where to position *guanxi* with some degree of accuracy within a manager's social network. In pursuit of that end, we here look for pattern in the views of business leaders for whom *guanxi* is a familiar term. In 2018, we asked a stratified probability sample of 384 Chinese CEOs running small to medium businesses what they meant when they referred to *guanxi*. We inventoried the respondents' key business contacts, and asked each respondent to identify which of their contacts was strong *guanxi*, and which were clearly not *guanxi*. Armed with these data, we can determine the network location of *guanxi* to test a structural definition of *guanxi* and test for performance correlates.

GUANXI DEFINED BY ITS NETWORK CORRELATES

As a frame of reference, we offer two hypotheses about *guanxi*. The first locates *guanxi* within network structure as structure is associated with trust. The second locates *guanxi* within network structure as structure is associated with achievement. A quick note on language before we begin: *Guanxi* is both singular and plural. We use “*guanxi* tie” to make explicit reference to *guanxi* as a kind of relationship, “*guanxi* contact” to refer to a person who is the object of a *guanxi* tie, and “*guanxi*” to refer to the category of relationships that qualify to be *guanxi*. Throughout, *guanxi* refers to valuable relationships. We are aware of discussions of *guanxi* networks, but *guanxi* relations are the fundamental units of *guanxi* networks (Fei, 1992 [1947]). Moreover, it is connection to the self that reinforces the dyadic nature of the concept, not the interconnectedness of the dyads (Fei 1992).

***Guanxi*, network, and trust**

Whether one draws on a metaphor of reinforcement from engineering, cognitive consistency from psychology, or social control from economics, law, or sociology, a familiar network prediction is that the strength of relationship between two people increases as the two people have mutual friends. For the purpose of this discussion, we reference the prediction as the closure-trust association. Trust is one of many kinds of strong connections, and strong connections are more likely between people who have numerous mutual friends – i.e., people whose relationship is embedded in a surrounding network of dense connections (often discussed as a “closed” network). In psychology, the association is predicted by balance theory (Heider 1946, 1958; Cartwright and Harary 1956). In economics, the association is core to business relations made manageable when embedded in a formal or informal social structure (Commons 1924; Coase 1937, for the foundations, up through Greif 1989), and in law, the association underlies descriptions of social order with or despite contracts (Ellickson 1991; Bernstein 1992, 2015). In sociology, the association is foundation for Granovetter’s (1985) work on relations embedded in social structure and Coleman’s (1988) work on social capital as the control people have over one another in closed networks, later applied in Putnam’s (1993; 2000) work with the social capital metaphor. We are guided in this discussion by the above: The more closed the network around a relationship, the more likely there would be reputation cost for

either party misbehaving, which lowers the odds of misbehavior, which lowers the risk of trust, which increases the probability of trust (review in Burt 2005, Chp. 3).

The closure-trust association is also foundation for Granovetter's (1973) discussion of weak ties as bridge relations. A bridge in graph theory is a relationship that connects two people who cannot otherwise be connected indirectly through others, but it is customary to discuss as bridges any connection between groups unlikely to coordinate with each other in the absence of the bridge. Granovetter (1973, p.1361) begins with a distinction between strong and weak ties: "the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie." As a didactic device, Granovetter (1973, pp. 1363-1364) then exaggerates the closure-trust association to suppose there is always some strength of tie between people who have mutual friends, and strong ties never occur in the absence of mutual friends, so (*italics in original*): "it follows that, except under unlikely conditions, *no strong tie is a bridge.*"

The above lines of work can encourage a perception that *guanxi* is a feature of closed networks. The common association of *guanxi* with emotional ties, warmth, obligation, and trust (Yang 1994; Bian 1997, 2018, 2019; Xiao and Tsui 2007) resembles Granovetter's description of strong ties as mixtures of time, emotion, intimacy, and reciprocity. It is a short step to then associate *guanxi* with closed networks: strong ties are likely in closed networks, *guanxi* is a kind of strong tie, so it follows that *guanxi* is more likely in closed networks. It is along these lines, that Xiao and Tsui (2007, p. 5) reason that *guanxi* is associated with membership in a densely-connected group, as "people who stay at the boundary of two in-groups tend to be distrusted by both groups."

We hypothesize that *guanxi* is separate from structure in its association with trust. To make our argument, we begin by emphasizing that Granovetter's forbidden triad was a didactic device, not a fact (cf. Kim and Fernandez 2022, p. 179). By combining the strength of a relationship with its location in network structure, Granovetter could make his engaging statement that weak ties had a unique kind of strength as bridges. The more probable empirical fact is that bridges are often weak ties, but weak ties are rarely bridges (Burt 1992, pp. 29-30; Burt et al. 2019, pp. 19-21). We unravel relation strength from location. We use strong versus weak to discuss the strength of a relationship, just as Granovetter used the terms. To discuss

network location, we use a distinction between the relations Putnam (2000) popularized as bonds versus bridges. As network locations, bridges are relations between people who do not have mutual friends; bonds are between people who do. With strength separate from location, strong ties can be bridges.

Next, we draw on recent research that shows the significance for trust of two kinds of embedding; relational versus structural. Introduced in Granovetter's (1992) reflection on his (1985) discussion of embedding, relational embedding occurs when today's relationship is between people who have history with one another. Structural embedding occurs when today's relationship is between people who have mutual friends. Of course, the two kinds of embedding can occur together. It is noteworthy when they do not.

Consider the closure-trust association in Figure 1. The graph summarizes analyses of relations with 4464 contacts cited by 700 respondents in a stratified probability survey of Chinese managers conducted in 2012. Relations are distinguished on the vertical axis of Figure 1 by a respondent rating each of his or her cited contacts for trust on a five-point scale. Relations are sorted on the horizontal axis by the number of third parties the respondent perceives as connected to both respondent and contact. Zero on the horizontal axis denotes a pair of people who have no mutual friends; their relationship is a bridge between their respective social worlds. To the extreme right are pairs of people who have six or more mutual friends. Illustrating the trust correlate of structural embedding predicted by the closure-trust association, the dashed line shows trust increasing with the number of third parties linking respondent and routine business contacts.

———— Figure 1 About Here ————

Relational embedding is illustrated by the solid line in Figure 1. Each respondent was asked to describe five significant events in the history of his or her business, then asked for the name of the person who most helped the respondent get through the event. The solid line in Figure 1 describes respondent trust in these "event" contacts. The solid line is higher than the dashed line, and relatively flat across the horizontal axis. In other words, respondents have more trust in event contacts, and that trust is relatively independent of having mutual friends. The closure-trust association for event contacts highlights the importance of history between trustor and trustee. Experience of a "critical test" in exchange, and receipt of unilateral favor builds relational trust (Kollock 1994), just as experience of fair, and

potentially advantageous behavior can solidify trust towards the other (Hardin 1991, 2002). Once a contact has proven to be trustworthy, mutual friends lose their importance for trust in the contact. The pattern of a higher, flat line for event contacts and a lower, increasing line for routine business contacts holds regardless of when a contact was cited for an event, regardless of the substance of the event(s) for which the contact was cited (Burt and Oppen 2017), and is robust across a wide variety of respondent differences (Burt et al. 2018).

Figure 1 was first discussed in terms of an intuition that contacts who helped with milestone events *could* be *guanxi* (Burt and Burzynska 2017). In the current survey, we explicitly ask respondents to identify contacts they see as their *guanxi*. We expect trust in non-*guanxi* ties to increase with structural embedding as predicted by the closure-trust association and illustrated by the dashed line in Figure 1. We expect trust in *guanxi* ties to be high on average, and relatively independent of structural embedding, as illustrated by the relational-embedding solid line in Figure 1:

Hypothesis 1: Compared to trust in non-guanxi ties, trust in guanxi ties is higher and less contingent on structural embedding.

Guanxi can occur with or without structural embedding, but the strength of a *guanxi* tie depends on its history more than the surrounding network structure. With respect to Figure 1, the hypothesis says that estimates of gamma should be positive and estimates of lambda should be negative.

***Guanxi*, network, and performance**

Our first hypothesis is analytically useful in freeing *guanxi* from closed networks, but performance differences are what primarily attracts interest in *guanxi*. Business success in China is believed to be associated with *guanxi* ties (Xin and Pearce 1996; Tsui and Farh 1997; Peng and Luo 2000; Park and Luo 2001, for reviews: Luo et al. 2011; Chen et al. 2013). The literature is replete with descriptions of the various ways in which managers and firms make use of *guanxi*. Reliance on *guanxi* ties helps to secure information, financial resources, and scarce raw materials, with positive effects for firm performance (Peng and Luo 2000; Oppen, Nee and Holm 2017). These ties help to secure public procurement contracts or successful outcomes in public biddings for state assets (Nee and Oppen 2012, Chp 9). They also help to secure scarce talent (Nee and Oppen 2012, Chp 7), and they can be critical for the resolution of legal disputes (Gong 2004). Moreover, the *guanxi*

association with business success is increasingly understood as being neither transitory nor linked to weak formal institutions (Guthrie 1998; Bian 2018).

We expect to see the usual evidence of higher performance from managers whose networks are rich in structural holes, but in particular, *guanxi* ties as trusted bridges should improve performance. This is not a question of whether a manager has *guanxi*. Having *guanxi* is like having a network; everyone has one. The question is whether a person has the *right guanxi* (Xiao and Tsui 2007), that is, the right people in the right place. Managers turn to *guanxi* when innovation poses a risk or reliance on market mechanisms alone does not guarantee timely and efficient access to resources and information. According to network theory, the *guanxi* that would best serve that purpose would be *guanxi* beyond the local group, i.e., *guanxi* ties that bridge structural holes between groups (Chang 2011, pp. 318–319 on bridging *guanxi*). Bridge *guanxi* are apparent in Figure 1. If Hypothesis 1 turns out to be true, which it will, then the solid line to the upper left in Figure 1 describes *guanxi* bridges. These are relations of high trust that are entirely, or relatively, free of third parties. They are the respondent's bridges to other groups. When *guanxi* connect individuals across groups, they serve as trusted bridges. Trusted bridges facilitate information transfer from one social cluster to another (Tortoriello and Krackhardt 2010), diffusion (Reagans and McEvily 2003; Centola and Macy 2007; Tortoriello, Reagans, and McEvily 2012; Centola 2018; Masuda et al. 2018; Guilbeault and Centola 2021), and, more specifically, job searches (Bian 1997).

Non-bridge *guanxi* — that is *guanxi* ties to contacts structurally embedded in mutual friends — are less likely to provide unique insights, novel information, and ability to access otherwise unattainable resources (although closed networks do not bar access to novel information; e.g., Aral and Van Alstynne 2011; Ter Wal, Alexy, Block, and Sandner 2016). Structurally embedded *guanxi* contacts are more likely to share opinions and assessments that are already circulating within the manager's business network. Experience in juggling alternative opinions is less likely than “echoing” what is generally perceived as the right path to pursue (Burt 2005, Chp. 4 on network echo). A related concern is that valued contacts, shared with others, can become generic go-to-contacts whenever serious issues arise. Once consultation with a structurally embedded contact turns into a routine, it is likely that templates successfully applied in the past replace novel information and search for situation

specific strategies (Levinthal and March 1993; Burt and Soda 2017; Opper and Burt 2021).

In short, we expect as a second hypothesis that structurally embedded *guanxi* provide less performance advantage than bridge *guanxi*:

Hypothesis 2: Performance increases more with bridge guanxi than with structurally embedded guanxi.

DATA AND METHODOLOGY

We have interviews conducted in 2018 with a probability sample of 384 Chinese CEOs leading medium to small private enterprises in China's Yangzi Delta region. The sample comes from three major cities: Shanghai, and two industrial hubs in the bordering province of Zhejiang: Hangzhou, and Ningbo. To improve the odds of productive variation with limited research budget, sample firms were drawn from two contrasting industries prominent in the region. "Automobile and vehicle parts" (Auto) represents traditional manufacturing, long established in the region. "Computer services and software" (IT) represents the region's proliferating computer businesses dealing with rapidly evolving information technology. Finally, we stratified by size to avoid over-representing easy-to-reach, small businesses and excluded businesses operating for less than three years and microenterprises with fewer than 10 employees.

We employed a local survey organization experienced in interviewing heads of business, and presented the research to the CEOs as "an international research collaboration to study the ways in which the people around the manager are involved in building a private company in China's Yangtze Delta region. The goal is to describe how private business contributed to the rise of modern China." Securing heads of business for relatively detailed face-to-face interviews can be challenging and our interviews lasted an average of 38.2 mins (a minimum of 20 mins and a maximum of 90 mins). Nevertheless, our CEO response rate of 33 percent is about the same as surveys of top management in the West (Baruch 1999; Mellahi and Harris 2016). Our sample of 384 respondent CEOs is primarily composed of owners or co-owners of the business (90%) who originally founded or co-founded the business (84%). The high proportion of owner-CEOs is typical for the region, especially in small and medium sized firms (Nee and Opper 2012). Of the sampled

businesses, 31% were launched with only the founders' personal assets. In 68% of them, the founders provided about half (52%) of the assets used to launch the business. The remaining assets came from bank loans (18%), family contributions (11%), friends (9%), and venture capitalists (2%). Only three businesses were launched without the founders' personal assets. Average gross income for the sample firms in 2017 (the most recent fiscal year preceding the survey) was 55 million CNY.² For these medium and small businesses, our respondent speaks for the enterprise. The median respondent founded the business, employs 66 people, and knows 30 customers personally.

Before releasing our survey into the field, we set up discussion groups with the local interviewer team reviewing the exact wording and meaning of each item to minimize interviewer-induced variation. We also conducted a two-day workshop with all field interviewers to standardize the survey implementation and to minimize potential interviewer effects. The training also included trial interviews with a number of business leaders that were attended by all interviewers and discussed during the workshop. We then ran pilot interviews with 10 CEOs in each of the three sample cities. Recruitment for the pilot study followed the same procedure in terms of size, location and industries as the sampling strategy for the main survey. The pilot study results did not warrant modifications in the survey questionnaire, but they did provide some pointers for standardizing the interview process.

Survey instrument

The survey involved two modules. One asked the respondent for personal and firm information. The second asked about the respondent's network in growing the business. The network around each respondent is measured in the usual way by asking for key contacts (people helpful in building and operating the business), then asking about the substance of the respondent's relations with each contact, and the strength of connections between contacts. Such questions are routine in network survey research (Marsden 2011; Perry, Pescosollido, and Borgatti 2018), in network surveys of management populations in particular (Burt, 2010, pp. 281ff.), and have precedent in China (Ruan 1998; Chinese General Social Survey 2003

²China's National Industry Classification system defines manufacturing firms with annual sales of more than 20 million CNY as medium-sized (so-called companies above designated size). The corresponding threshold for IT companies is 10 million CNY.

cgss.ruc.edu.cn/English/Home.htm; Xiao and Tsui 2007; Batjargal et al. 2013; Bian and Li 2012).

The survey instrument and materials are available (see acknowledgement note), but as a reference for the analysis to be presented, our name generators and name interpreters are listed in Table 1. To maintain anonymity of named contacts, respondents were encouraged to use alias names when listing their contacts, and were reminded to retain as confidential the auxiliary sheets on which they wrote the names of their network contacts.

We began the network module by asking respondents to identify key events in the history of the business. Following the company founding, we asked respondents to provide up to five additional events, beginning with the most important event. Some respondents stopped at four events, but the majority (55%) provided five. Then, the name generator in the first row of Table 1 asked the respondent to name the person who was most valuable in founding the business. Each respondent named one person (384 contacts). Next, the respondent was asked for the names of the contacts most valuable in each of the cited four to five events. Although respondents could name up to six different contacts (founding event plus up to five subsequent events), many cited some contacts for multiple events. The average respondent named 4.67 different people, with two the smallest number and six the largest. The second row in Table 1 shows that respondents named a total of 1,571 contacts for significant events after founding. The people named as most valued in founding the business, dealing with the most significant event, or dealing with another significant event, we discuss as “event contacts.”

———— Table 1 and Table 2 About Here ————

To assemble current contacts, we used the four other name generators at the top of Table 1: who are the most valued people this year, who was most difficult to deal with this year, who is your most valued employee, and a final question asking for any valuable contacts not elsewhere classified. Table 1 shows that only 9 contacts were added in response to the final name generator. The average respondent named 4.64 different people as current contacts, with two the smallest number and seven the largest. People cited on these four name generators we discuss as “current contacts.”

Combining event and current contacts, the average respondent named 7.04 different people as key business contacts, with four the smallest number and 11 the

largest. Many of the people cited as most valued during significant events were also cited as current contacts. The final count of 2,702 people named as key business contacts by the 384 sample CEOs are 908 cited only as current contacts, 921 cited only as event contacts, and 873 cited as current contacts who have been valued help during significant events in the history of the business.

Given a set of key business contacts named, the remaining items in Table 1 were used to describe relations with and among contacts. The last name interpreter asks for the strength of connections between the respondent's cited contacts. Using these data, combined with the data on how close the respondent feels toward each contact, we followed Burt and Burzynska (2017, Appendix) in scaling the strength of connection between each pair of people to vary between zero and one. Varying from four to 11 contacts around a median of seven, each respondent's network is a matrix of symmetric connections with and among contacts.

Table 2 contains the *guanxi* name interpreter. The respondent was first asked whether he or she is familiar with the word *guanxi*. Almost everyone said they were (95%). The respondent was then asked to give his or her own definition of what the word meant, which was written down by the interviewer, after which the respondent was asked to look over the list of cited contacts to identify the person with whom the respondent had the strongest *guanxi*. Every respondent named someone, but some respondents insisted that multiple contacts were their strongest *guanxi*. That is why the number of contacts named on part C in Table 2 is 398, instead of the number of respondents, 384. We then asked whether the respondent had almost as strong *guanxi* with any of the other listed contacts. Another 389 contacts were named. Finally, to anchor the other end of a *guanxi* continuum, we asked which people on the list are not *guanxi* to the respondent. Thus, responses to the *guanxi* name interpreter in Table 2 distinguish four categories of contacts in terms of *guanxi*: strongest *guanxi* (398 contacts), *guanxi* (389 contacts), not *guanxi* (274 contacts) and other contacts uncited on any items in Table 2 (1,641 contacts).

Contextual meaning of the identified *guanxi* ties

To display face validity for our *guanxi* data, we offer a brief description of the relations and people identified as *guanxi*, which are broadly consistent with past research. *Guanxi* relations are argued to have three qualities: warmth, obligation, and trust (Yang 1994, p. 111; Bian 1997, p. 369; see Chen, Chen, and Huang 2013;

Bian 2018, 2019 for broad review; Luo, Huang, and Wang 2011 for meta-analysis). With respect to the warmth of emotional closeness, people tied by *guanxi* have a familiarity, an intimacy with one another; a sentiment akin to the ideal of positive relations within a family. A second quality is obligation. People connected by *guanxi* have an expectation of the other's help if trouble arrives; again much as family members are expected to look out for one another. A third quality is trust, associated with obligation. *Guanxi*-connected people believe they can trust one another.

In the absence of network data, researchers have distinguished *guanxi* ties by role relations associated with warmth, obligation, and trust — relations such as family, or close friends from school (e.g., Farh et al. 1998). Such measurement is awkward because *guanxi* does not reduce to a particular role. Rather, it is likely, but need not, develop in the context of certain roles. Yang (1994, p. 111) cautions: “Friendship, kinship, classmates, and so forth are not coextensive with *guanxi*, but serve as bases or potential sites for *guanxi* practice.”

Armed with rich network data and respondent distinctions between contacts who are and are not *guanxi*, we can make unprecedentedly clear statements about the kinds of relations and people believed to be *guanxi*. To create a summary image of the data, we coded each cited relationship for the presence or absence of 53 characteristics. For each of the 2,702 cited contacts, a row variable in Table 3 equals 1 if the row characteristic is present in the relationship, 0 otherwise. Means in Table 3 show the frequency with which each row characteristic occurs. For example, 1,296 contacts were cited as most valued contacts this year (48% in row four of Table 3), and 209 of cited contacts were members of the respondent's family (8% in row eight of Table 3).

———— Table 3 and Figure 2 About Here ————

We performed a classical multidimensional scaling on the 2702 by 53 matrix of binary data to generate the content map in Figure 2. Two variables are close together in the map to the extent that they often occur together in the same relationships. The data are well described by the two dimensions in Figure 2. The horizontal axis describes 75 percent of observed variance by distinguishing negative relations to the left versus positive to the right. The vertical axis describes 17 percent of observed variance by distinguishing personal relations at the top of Figure 2 from other positive business relations at the bottom. The horizontal axis is about four and a half times as long as the vertical axis, reflecting the relative variance described

(75/17 = 4.41). The two dimensions in Figure 2 are a pattern familiar in China (Burt and Oppen 2017, pp. 508-510) and the West (Burt 2005, pp. 50-53, 2010, pp. 283-288), with the additional feature here of having respondent distinctions between *guanxi* categories in the space.³

Guanxi ties cluster in the upper-right in Figure 2 as the most positive, most personal relations in a respondent's network. Here are the contacts with whom the respondent feels he or she has the strongest *guanxi* (#53) and contacts with whom *guanxi* is almost as strong as the strongest (#52). Other characteristics in the upper-right quadrant illustrate the warmth, obligation, and trust qualities used in the past to characterize *guanxi* (Yang 1994; Bian 1997, 2018, 2019). Here are the contacts, with whom the respondent feels especially close (#38), and in whom he or she has the highest level of trust (#45), and with whom he or she would be most willing to collaborate on a project (#49). Unsurprisingly — given the high level of trust — here are also the contacts known for a long time (#28, known for more than 20 years, and #27, known for 11 to 20 years; on average *guanxi* contacts have been known for 17 years). Here too are family contacts (#8). Even though respondents cite few family members in their network of business contacts (8% of all contacts), family tends to be *guanxi*. At the same time, most *guanxi* ties are not family (of the contacts rated “strongest *guanxi*,” two thirds are not family, 65%). When family are included in the network, however, they tend to be named as *guanxi*, which is why family appears in the upper-right quadrant of Figure 2. Consistent with the notion that *guanxi* are essential to business, the upper right quadrant is also populated by contacts cited as most valued in founding the business (#1) and those most valued in helping the respondent with the most important event in the history of the business after founding (#2). Nine out of ten *guanxi* contacts were named on the events cited in the interview.

³Details in Figure 2 are substantively interesting, but not needed to test our hypotheses, so here is a quick sketch for interested readers: To measure the extent to which characteristics in Table 3 occur in the same relationships, we computed Jaccard coefficients for each pair of the characteristics. Wishing to stay close to the metric of the data, we then ran a classical multidimensional scaling on the Jaccard coefficients. The scaling uses an eigenvalue decomposition as in a principal component analysis. Of the 53 dimensions possible, the first “describes” 75 percent of variance (ratio of first eigenvalue divided by the sum of all eigenvalues), and the second 17 percent. The third eigenvalue is much smaller than the second (one percent of variance), so it, and all subsequent dimensions, are discarded. The scaling was performed using Stata's “MDS” routine with the “classical” option.

We also analyzed the language respondents used to describe *guanxi* before identifying their *guanxi* contacts. The lack of clustering or thresholds in the distribution of their descriptions, shows that there is not one group that prefers certain words to describe *guanxi* while another group prefers other words. The respondents differ in the complexity of their *guanxi* descriptions, but the content of their *guanxi* descriptions is consistently warmth, obligation, and trust.

Testing Our Hypotheses

We perform two sets of estimations. First, to test whether trust in *guanxi* depends less on their structural embeddedness compared with trust in non-*guanxi* (Hypothesis 1), we use OLS regressions to predict trust levels in the 2,702 cited contacts. To test our second hypothesis, we use OLS regressions predicting performance by the businesses led by the sample CEOs.

Dependent variables

We have two dependent variables: trust and performance. With respect to trust, we conceptualize it as “a psychological state comprising the intention to accept vulnerability based on positive expectations of the intentions or behavior of another” (Rousseau et al. 1998, p. 395; see also Mayer et al. 1995). To ensure that all respondents could equally relate to the question, the wording of the question also included examples of concrete situations illustrating norm violations applicable to contacts with different roles (see Table 1). The question was framed in a way that speaks to a manager’s everyday business experience. It not only captures managers’ willingness to be vulnerable as the help is costly, but also captures managers’ positive expectation on the behavior of the cited contact to the extent that a contact would disclose all relevant information for managers to make an informed decision. Respondents were asked to use a scale from 1 to 5, with 1 describing the lowest and 5 the highest trust level.

We measure business performance using average company returns on assets (ROA) over a three-year period from 2015 to 2017. We get the same results using ROA for 2017, the most recent year for which annual ROA data were available at the time of the survey (.96 correlation between average ROA and ROA in 2017), but we prefer to report results with average ROA over multiple years so we work with more stable differences in relative performance.

Control variables

We include three types of control variables. First, we include several CEO attributes: gender (CEO male), CEO age, company founder (CEO founder), years of education (CEO education), and party membership (CEO party member). Second, we include company controls for assets available to grow the business (assets at firm founding), difficulty in establishing the business indicated by the time required for the business to become profitable (years to firm profitability), and the difference between firms in traditional manufacturing versus the rapidly-growing IT industry (IT). We also include city controls to hold constant variation in the local business environment.

Network predictors

We predict from network constraint and structural embedding. Both measures concern the extent to which a respondent has access to network bridges. Given a matrix of relations with and among a respondent's core contacts, contact-specific network constraint, c_{ij} , measures the extent to which respondent i 's relations are concentrated in direct or indirect connections with contact j (Burt 1992, Chp. 2): $c_{ij} = [p_{ij} + \sum_k p_{ik}p_{kj}]^2$ for $i \neq k \neq j$, where proportional connection p_{kj} is the strength of the relation between contacts k and j relative to the sum of k 's relations ($z_{kj} / [\sum_j z_{kj}]$). The contact-specific constraint score increases from zero to one with the extent to which the respondent cannot avoid the contact within the network. The sum of contact-specific constraint scores for a respondent defines *network constraint* ($C = \sum_j c_{ij}$), which increases with the extent to which the respondent has a small number of strongly interconnected contacts, which indicates low access to structural holes, which is associated with low performance. We multiply constraint scores by 100 to speak in terms of points of constraint. *Guanxi* ties are distinguished within the network based on answers to the name interpreter in Table 2.

To measure structural embedding, we compute the extent to which the respondent is connected to a contact indirectly through mutual colleagues in the respondent's network. We count the number of mutual colleagues connected to respondent and contact (horizontal axis in Figure 1). We also compute the summed strength of indirect connections between respondent and contact ($\sum_k z_{ik}z_{kj}$, $i \neq k \neq j$,

where z_{jk} is the strength of connection between j and k).⁴ To test Hypothesis 1, we predict respondent trust in contact j using the structural embedding between respondent and contact j . We predict the performance correlate in Hypothesis 2 from structural embedding around a respondent's strongest *guanxi* (number of mutual contacts connecting respondent and strongest *guanxi*, or sum of indirect connections through mutual contacts). For the 14 respondents who insisted on naming more than one strongest *guanxi* (12 named two contacts, one named three, and one named four), we average structural embedding across the contacts named. (We reach the same conclusions with or without the 14 respondents.)

RESULTS

Hypothesis 1: High trust in *guanxi* ties independent of context

Figure 3 is a replication of Figure 1 in support of our first hypothesis. The vertical axes distinguish cited contacts by the respondent's level of trust in the contact. The horizontal distinguish relations by structural embedding, which varies from respondent and contact having no mutual contacts within the respondent's network, up to contacts with six or more mutual contacts. In Figure 3A, *guanxi* ties are defined by different kinds of event contacts suggested in Burt and Burzynska's (2017) analysis. The top line in Figure 3A describes trust in contacts cited as most valued in founding the business. Trust is high across all levels of closure on the horizontal axis. Contacts cited for other significant events in the history of the business are trusted at a lower level, on average, and there is evidence of trust increasing with closure. The lowest level of trust, and strongest association with closure, describes trust in contacts not cited in association with events. The pattern is a replication of the pattern initially reported from the 2012 data to propose a network definition of

⁴Contact-specific constraint, c_{ij} , is a more comprehensive measure of embedding, but it includes relational and structural embedding so using it would introduce ambiguity into our hypothesis testing. The c_{ij} score differs from the summed strength of relations in three ways: relations are weighted by their proportion within the respondent's network, strength concentrated in a subset of relations increases c_{ij} , and the respondent's own relation with contact j is included in contact-specific constraint. All three features increase multicollinearity with aggregate constraint, which is a complication for testing our second hypothesis, and the third difference means that the respondent-contact connection is on both sides of the equation in testing our first hypothesis (trust as dependent variable and emotional closeness as predictor). Not surprisingly, respondent trust in a contact is more strongly correlated with c_{ij} than it is with third parties to the relation with contact j (.39 versus .21 for a count of third parties, .28 for weighted sum of connections through third parties).

guanxi (Burt and Burzynska 2017, p. 234; Burt and Opper 2017, pp. 517-518; Burt et al. 2018). Figure 3B shows a similar, if more obvious, pattern when we use the respondents' own definitions of who among their contacts are *guanxi*.

———— Figure 3 About Here ————

Table 4 contains statistical tests (with descriptive statistics in Table 5). We present robust standard errors (jackknife) estimated with individual fixed effects to better compare multiple relations described by each respondent. All closure-trust associations in Table 4 are statistically significant beyond a .001 level of confidence, so we do not distinguish coefficients in the table by level of significance. Models 1 and 2 predict trust when *guanxi* is defined by significant events in the history of the business. The other models rely on *guanxi* defined by each respondent.⁵

The results on level of trust, and trust increasing with structural embedding, are similar whether we define *guanxi* by events or have respondents select which of their contacts are *guanxi*. In all models, trust is higher in *guanxi* relations (solid lines in Figure 3 are higher than dashed lines). In Model 4, for example, trust within *guanxi* ties is on average a point higher on a five-point scale (.95 coefficient, 15.30 test statistic, which is statistically significant well beyond a .001 level of confidence). In all models, trust within non-*guanxi* relations increases with the extent to which the relation is embedded in third parties (dashed lines in Figure 3 have steeper slopes than the solid lines). In Model 3, for example, an embedding increase from zero to two third parties is associated with an average increase of slightly less than one point in level of five-point trust ($.86 = .78 \text{ coefficient times } 1.10 \text{ log score}$; 30.61 t-test for the coefficient, again well beyond a .001 level of confidence).

———— Table 4 and Table 5 About Here ————

Further support for Hypothesis 1 comes from the interaction effects at the bottom of Table 4. The hypothesis is that trust within *guanxi* ties is less contingent on structural embedding. The lack of contingency is visible in Figure 3 from the solid

⁵The results in Table 4 are estimated with respondent fixed effects, so sampling strata differences in industry, firm size, and city are held constant. Given the sharp performance difference between sample firms in IT versus those in traditional manufacturing, we checked for industry effects. We re-estimated the six models in Table 4 without respondent fixed effects, adjusted the standard errors for autocorrelation between relations cited by the same respondent (Stata "cluster" option), and added a dummy variable to distinguish respondents in the IT industry. The explicit IT control is negligible in all six models in Table 4, generating t-tests of 0.81, 0.84, 1.01, 1.03, 1.01, and 1.02 in Models 1 through 6 respectively, so the probability is over .3 that trust is independent of industry.

lines for *guanxi* ties being less steep than the dashed lines for non-*guanxi* ties. In Table 4, all slope adjustments for trust within *guanxi* ties are negative and statistically significant. In other words, trust is significantly less contingent on structural embedding around *guanxi* ties. In Model 4, for example, there is a .94 coefficient describing how trust increases with the strength of connection between respondent and contact through mutual colleagues. That coefficient is decreased by .57 to describe the trust association with structural embedding around *guanxi* ties (beta minus lambda in Figure 1; -9.76 t-test for the -.57 coefficient, which is statistically significant well beyond a .001 level of confidence). In fact, trust within *guanxi* ties can be viewed as independent of structural embedding. When we estimate association between trust and structural embedding for the relations defined by respondents to be *guanxi*, test statistics fail to reject the null hypothesis (1.16 t-test for number of third parties, 1.27 t-test for strength of connection through third parties, both giving more than a .20 probability to the null hypothesis).

The final point we take from Table 4 is that support for Hypothesis 1 is stronger for relations that are more clearly *guanxi*. While trust is independent of structural embedding for *guanxi* ties defined by the respondent him or herself, that is not true for *guanxi* inferred from events. This is visible in Figure 3: the solid lines in Figure 3B, where respondents define *guanxi*, are flatter than the solid lines in Figure 3A, where *guanxi* are inferred from significant events. And test statistics do reject independence when we estimate association between trust and structural embedding for *guanxi* inferred from events (3.06 t-test for number of third parties, 3.32 t-test for strength of connection through third parties, both giving less than a .01 probability to the null hypothesis). Further, the slope adjustment for trust contingency on structural embedding is more obvious for *guanxi* ties in Table 4 when respondents define which of their contacts are *guanxi* (-7.77 test statistic for the -.44 coefficient in Model 3 and -9.76 for the -.57 coefficient in Model 4 versus -4.32 test statistic for the -.31 coefficient in Model 1). And third, Models 2, 5, and 6 in Table 4 show that support for Hypothesis 1 is stronger for relations that are more clearly *guanxi*. The models distinguish strongest *guanxi* from other *guanxi*. In Model 2, strongest *guanxi* is the contact most valued in founding the business. Other *guanxi* is any contact named as most valued for their help during significant events after founding. The trust level adjustment is higher for strongest *guanxi* (1.81 versus 1.10 coefficient), and the slope adjustment for strongest *guanxi* removes more of the

trust-closure association found in routine business relations (-.45 versus -.28 coefficient). In Model 5, strongest *guanxi* is whomever the respondent named as his or her strongest *guanxi*, and other *guanxi* is whomever the respondent named as almost as strong. Again, the trust level adjustment is higher for strongest *guanxi* (a coefficient of 1.63 vs. 1.33 coefficient), and the slope adjustment for strongest *guanxi* removes more of the trust-closure association found in routine business relations (-.48 versus .40 coefficient). And stronger estimates occur in Model 6, when embedding is measured by strength of connection through third parties rather than the count of third parties in Model 5. In sum, we find strong support for the first hypothesis.

Hypothesis 2: *Guanxi* improve performance by providing strong bridges

The proverbial association between *guanxi* and business performance is illustrated in Figure 4. The horizontal axes distinguish respondents by network constraint. Small, dense networks are to the right. Large, open networks are to the left. Dark dots show our performance measure, return on assets (ROA). Providing corroboration, hollow dots show return on equity. Both profit measures are displayed on the vertical axes as z-scores adjusted for business assets/equity, industry, and the time it took for the business to become profitable.⁶ Figure 4A shows the usual non-linear negative association with constrained networks (cf., Burt 2021, p. 390 for the association across study populations): The smaller and more dense a respondent's network, the lower the relative profit returned by his or her business. The -.58 slope coefficient in Figure 4A says that a unit increase in log network constraint, such as an increase from 15 to 40 points of constraint, is associated with a drop of about half a standard deviation in returns.

———— Figure 4 About Here ————

Figure 4B shows what happens if respondent networks are limited to current contacts — which is standard practice in social network research. Of 787 contacts

⁶Regressing return on assets across value of the business' assets, industry, years after founding until the business was profitable, and log network constraint, shows a -.08 coefficient log network constraint and -3.63 t-test for lower profit margins in businesses run by people with more closed networks ($P < .001$). For an adjusted profit measure, we ran the regression without network constraint and use the studentized residual as the vertical axis in Figure 4. Regressing return on equity across value of the business' equity, industry, years after founding until the business was profitable, and log network constraint, shows a -.25 coefficient for log network constraint and -4.01 t-test for lower profit margins in businesses run by people with more closed networks ($P < .001$).

distinguished as *guanxi* ties, 456 were named as current contacts (name generators in Table 1 rows 3 to 6), so Figure 4B includes the many *guanxi* ties that have been contacted recently. The network association with performance is still evident, but there is more variation around the regression line. The $-.58$ slope in Figure 4A drops to $-.24$ in Figure 4B. The weaker result with networks of current contacts might help explain why some well-executed network studies in China do not find the expected network-performance association (e.g., Xiao and Tsui 2007).

Excluding all *guanxi* ties completely obscures the network-performance association. Figure 4C shows no association. This is not a result of the association being weaker because ties are deleted. The association is strong in Figure 4B but gone in Figure 4C despite there being more relations in the latter (1915 contacts in the Figure 4C networks versus 1781 in the Figure 4B networks). More telling, the network-performance association is obvious again in Figure 4D, which is based on networks that exclude ties respondents identified as “not *guanxi*.” The slope coefficient of $-.50$ in Figure 4D is almost the same as the slope of $-.58$ in Figure 4A, where networks are defined by all available contacts. *Guanxi* ties in particular are relevant to performance. Ties that respondents deem “not *guanxi*” are not performance enhancing, so the network-performance association is robust to their deletion.

More specifically, our second hypothesis says that *guanxi* ties should improve performance more when they are bridge relations. That is precisely the result in Table 6 (descriptive statistics in Table 7). Initially, we measure a respondent’s network by the extent to which the respondent’s strongest *guanxi* tie is structurally embedded. Embedding is measured by a count of third parties in Model 7, and by the sum of indirect connection through third parties in Model 8. Performance is lower for respondents whose strongest *guanxi* is more deeply embedded in third parties (-3.11 t-test in Model 7, -3.33 in Model 8).⁷

———— Table 6 and Table 7 About Here ————

⁷Every respondent indicated one or more *guanxi* ties, but three would not distinguish strongest *guanxi*. Those three respondents are treated as missing data for the analysis of Hypothesis 2 in Table 6. As a check on our inferences we imputed for the three missing respondents *guanxi* embedding using their least-weak *guanxi* contact, and re-estimated the models in Table 6. The results are nearly identical. For example, the -3.67 coefficient for *guanxi* embedding in Model 9 (-3.14 t-test, $P \sim .002$) is -3.65 with the imputed scores for *guanxi* embedding (-3.20 t-test, $P \sim .001$).

The performance erosion associated with one's strongest *guanxi* being embedded is robust to, though correlated with, the rest of a respondent's network. The correlation between log scores is .58 for network constraint and the strength of indirect connection through third parties embedding a respondent's strongest *guanxi*. In other words, the respondents who embed their strongest *guanxi* in mutual contacts are people who on average embed their non-*guanxi* contacts in mutual contacts. Network constraint in Tables 6 and 7 is re-computed to exclude the respondent's strongest *guanxi*, which brings the .58 correlation down to .35 (.24 in Table 7 for raw scores). Models 9 and 10 show the usual negative performance association with network constraint — but holding that constant, the models support our second hypothesis in showing statistically significant performance erosion for respondents whose strongest *guanxi* is more embedded in third parties (-2.88 t-test in Model 9, -2.69 in Model 10). Across the models in Table 6, the performance erosion of embedded *guanxi* is robust to respondent gender, age, education, party membership, and whether the respondent founded the business. The erosion is also robust to the statistically significant higher profit margin in the IT industry, and the tendency for lower profit in businesses that required more years before they became profitable.

The performance differences are sharply apparent in Figure 5. The vertical axis is the dependent variable in Table 6, return on assets. "Relatively closed networks" in Figure 5 have a network constraint score higher than the median (using the constraint score in the third row of Table 6).

Within each category of relatively-closed or relatively-open networks, we sort respondents by bridge relations, where a bridge relation is any relationship for which indirect connection through others in the network is less than one strong tie (weighted third parties predictor in Table 6 is less than 1.0). Bridge relations include all of the Figure 3B cited relations for which there are no mutual contacts, many relations for which there is weak connection through one mutual contact, and some of the relations for which there are weak connections through two or three mutual contacts. The dark bars in Figure 5 contain respondents who have no bridge relations in their networks. The vertical-line bars contain respondents who have bridge relations, but their strongest *guanxi* tie is not a bridge. The white bars contain respondents whose strongest *guanxi* is a bridge relationship.

———— Figure 5 About Here ————

The aggregate network-performance association is illustrated by the bars to the right being higher than the bars to the left. In fact, there is no statistically significant difference between the first four bars in Figure 5.⁸ In other words, *guanxi* bridges do not help a person whose network is by and large closed.

The performance association with *guanxi* is illustrated by the three bars to the right in the figure. The lowest performance is for relatively open networks with no bridge relations (dark bar). Higher performance is observed among respondents who have bridge relations, even if their strongest *guanxi* is not a bridge (vertical-line bar). But the highest performance is observed in relatively open networks wherein the strongest *guanxi* is a bridge beyond the network (white bar).⁹ The network-performance association is concentrated in bridges, as so often observed in past work — especially in *guanxi* bridges, which have been neglected in past research.

CONCLUSION AND DISCUSSION

We treat *guanxi* as an example of what Merton and Barber (2004, p. 256) term a niche-word, a word that expresses "a familiar kind of human experience that transcends national and other cultural and linguistic boundaries." We argue that *guanxi* distinguishes a kind of relationship that is familiar, consequential for network predictions, but not yet distinguished in network theory. We use interviews with a stratified probability sample of Chinese CEOs to look for pattern in the ways they use the term *guanxi*, and the performance relevance of relations they designate *guanxi*. Phrased in terms of network theory, our conclusion is that *guanxi* is a tie that has become strong through its history such that trust within the relationship is high and

⁸Specify a regression model predicting the dependent variable in Table 6. Include all the control variables in the table. Replace the two network predictors in the model (first three rows) with a six-category variable distinguishing the six bars in Figure 5. Take as a reference category the first bar to the far left: a relatively closed network containing no bridges. Using the Table 6 estimation, average performance differences from the reference category are -.82 and 0.49 for the subsequent two categories of relatively closed networks, and -.88, 4.90, and 9.43 for the three categories of relatively open networks. Performance in categories two, three and four is about the same as performance in a relatively closed network containing no bridges (0.19 $F_{(3,380)}$, $P \sim .90$). Specifically noteworthy is that *guanxi* bridges provide no advantage in a relatively closed network (0.49 coefficient has a 0.23 t-test, $P \sim .82$). Performance improves for relatively open networks containing bridges (4.90 coefficient has a 2.35 t-test, $P \sim .02$), but improves most for relatively open networks in which the strongest *guanxi* is a bridge (9.43 coefficient has a 3.89 t-test, $P < .001$).

⁹These two network effects are the two statistically significant network-performance associations in Figure 5 (see previous note).

independent of the surrounding network (Hypothesis 1). The empirically validated definition gives *guanxi* ties a role in network theory, a role that is complementary and distinct from the role played by strong ties more generally. In contrast to the discussion of strong ties deriving some large portion of their strength from corroborating relations with mutual friends and colleagues (structural embedding), *guanxi* ties derive their strength from the personal history between two people (relational embedding). As such, *guanxi* ties, when most valuable, are strong bridges able to provide performance-relevant trust across structural holes. The more structurally embedded *guanxi* are, the less they operate as network bridges, and the lower their association with performance (Hypothesis 2).

Contribution to social network theory

The discussion positions *guanxi* within network theory to improve predictions from the theory, and facilitate unambiguous use of *guanxi* as a concept in the theory. As illustrated in Figure 3, in support of our first hypothesis, trust is high in *guanxi* ties even when there is no support from mutual contacts. Lack of support from mutual friends makes such *guanxi* ties a network bridge, typically from one group to another. As illustrated in Figure 4, the strong performance association with a manager's network (Figure 4A), weakens when *guanxi* ties not in the current network are overlooked (Figure 4B), and disappears when all *guanxi* ties are excluded (Figure 4C). In support of our second hypothesis, the strong bridges that *guanxi* can provide are not only distinct from other strong ties, they are a significant component in the performance association with networks (Figure 5).

Argument for the importance of strong bridges is not new. Tortoriello and Krackhardt (2010) argue that point with respect to collaboration across groups (advanced by Krackhardt 1992, 1999), and Centola and Macy (2007) argue the point with respect to the diffusion of complex ideas and practices (elaborated in Centola 2018). Early evidence on Chinese business networks is consistent with their arguments. Burt and Burzynska (2017) and Burt and Opper (2017) report a strong network-performance association in a large 2012 probability sample of Chinese business leaders. Businesses that grew larger and more profitable tended to be run by people with networks richer in structural holes. The two Chinese studies also report that the performance association with networks disappears if event contacts are excluded from the network. Figure 2 shows that event contacts tend to be named

as *guanxi* in our interviews, so it is not surprising that we replicate Burt, Burzynska, and Opper's results now with explicit *guanxi* data.

But this is more than replication. Krackhardt and Tortoriello, and Centola and Macy build on the traditional closure-trust association using structural embedding to distinguish strong bridges. There are two problems with that strategy: First, as the number of mutual contacts increases, what was a bridge between groups changes into a bond between elements within an integrated group. Second, relying solely on structural embedding to identify strong bridges misses the many bridges strong through relational embedding. Those strong bridges are captured as *guanxi* ties. Almost half of the 787 *guanxi* ties distinguished by our respondents have two or fewer mutual contacts, and many exist free of any mutual contacts (43% and 16% respectively). That is a large share of strong bridges to miss.

Guanxi ties are not without their own weakness: Their existence depends on time and events. The *guanxi* ties reported to us tend to be with people known for many years, and tend to emerge from a person being a valued source of help during a significant event. The accumulation of experience essential to relational embedding takes more time than does mobilizing mutual friends for structural embedding. To the extent that time and events are necessary ingredients in developing *guanxi* ties, such ties are going to be more difficult, and slower, to build than non-*guanxi* strong ties that exist as a by-product of mutual friends.

The two kinds of strong ties are most likely co-dependent. *Guanxi* ties provide seed relations around which third parties accumulate when family members and close friends introduce one another to people they enjoy. At the same time, *guanxi* ties can emerge from empathy and assistance between two individuals structurally embedded within a family or group of mutual friends. Pattern in, and correlates of, developmental co-dependence offer an intriguing prospect for future research.

Contribution to practice

The contribution to network theory raises a practical question: Are people being trained correctly to build performance-enhancing networks? Training has a goal of managing social connections and networks to improve a person's well-being. The popularity of networking events vividly illustrates belief in that value proposition. The productive value of such events, however, could hinge on a better understanding of the etiology of *guanxi* ties.

A routine activity in organizations is to bring people with shared interests to a networking event, at which they identify mutual friends, which facilitates the development of strong ties. These events can end up doing little more than reinforcing existing connections (Ingram and Morris 2010). The advisory has been to encourage participants to strike up conversations with new contacts because the information value of bridge relations is exposure to diverse perspectives and practice. But we do not readily accept information contrary to our beliefs or understandings. We are each of us fully armed with rationalizations that protect (indeed, isolate) us from information inconsistent with what we know. What if the new information comes from a trusted friend — a *guanxi* contact? We suspect it matters quite a bit (reinforced by evidence and examples in Katz and Lazarsfeld 1955 and Centola 2018). To the extent feelings about the source do matter, network training likely puts too much emphasis on adding casual ties beyond the group, and not enough for building *guanxi* ties beyond the group (see Dahlander and McFarland 2013 on tie formation versus tie persistence).

Here again, time is an issue. To the extent that time and events are primary ingredients in developing *guanxi* ties, such ties are going to develop more slowly and with more difficulty than non-*guanxi* strong ties. But to say that existing *guanxi* ties developed slowly over time and through events is not to say that they must develop that way. To improve training effectiveness (assuming our contribution to theory is correct), we might shift from studying where *guanxi* exists to asking where it could exist, and how quickly (Frank, Gilovich, and Regan 1993; Meyerson, Weick, and Kramer 1996).

The training issue is particularly ironic in China, home of *guanxi*. Mirroring the folk wisdom that success in China depends on *guanxi*, advice distributed — during cross-cultural training courses, networking events in China, MBA programs, and graduate courses — is replete with recommendations to foster *guanxi* ties. Until now, having the “right contacts” has largely been regarded as a question of role selection. For example, it would be wise to get to know the local party secretary, the director of the local bank, the local mayor. However, as we have shown, *guanxi* value hinges on two factors: high trust levels independent of the contact’s social embedding, and equally important, a marginal position in the manager’s network. The two conditions do not arise serendipitously. While Chinese managers are mindful of the need to build instrumental ties that may at some point mature into *guanxi*, their Western

counterparts may easily confuse dinner invitations with meaningful relations building trust. A clearer analytical understanding of the sources of *guanxi* value in the broader network context is a promising first step toward building valuable relationships.

Contribution to comparative work across cultures

We see two contributions to work across cultures. Obviously, our results establish a fruitful arena for integrative work between scholars in China and the West. For network scholars in both arenas, there is reassuring evidence that the network-performance association so widely reported in the West is in fact not culturally contingent, but general. Finding the most valuable *guanxi* at the margin of the manager's network reinforces the conclusion that *guanxi* advantage — like broker advantage more generally — is grounded in breadth, timing, and arbitrage across separate groups and constituencies. Dismissing *guanxi* as a Chinese word for strong ties misses the critical role that *guanxi* play as strong bridges. What proportion of the bridge ties associated with manager success are dyadic, personal connections akin to *guanxi*? How much of the abundant network-performance evidence depends on contacts comparable to *guanxi* bridges? These are questions that need answers to arrive at stronger network theory bridging East and West.

In service of obtaining those answers, our instrumentation provides unprecedented data on *guanxi* as an identifiable element in social networks. To our knowledge, no previous research has had network and language data from a representative sample of business leaders describing *guanxi*.¹⁰ The data provide foundation for comparing *guanxi* ties with non-*guanxi* ties to study the emergence, correlates, and consequences of *guanxi* ties.

Less obviously, our analysis has implications for understanding strong bridges in cultures other than China. In the opening paragraph to this article, we listed select words used to identify network advantage — *guanxi* in China, *piston* in France, *vitamin b* in Germany, et cetera. For initial study, we chose *guanxi* because it is a word so widely used in China. We were confident that most respondents in a probability sample of Chinese business leaders would have given some thought to advantage qua *guanxi*. In populations where people share less widely a colloquial

¹⁰Yan and Yasseri (2017) analyze a collection of tweets that contain the word *guanxi*. The reference population is unclear (anyone tweeting during the data collection intervals) and the topics discussed when *guanxi* was mentioned are unknown. Nevertheless, Yan and Yasseri provide a template for intriguing analysis of *guanxi* texts.

word like *guanxi*, network theory still defines individual advantage, so strong bridges from relational embedding should still be associated with differences in performance.

Working from available results, we see at least four research strategies to identify and study *guanxi*-like relations in diverse populations. The strategies are grounded in duration, contingent duration, event name generators, and reverse-engineered *guanxi*.

Guanxi ties are the result of relational embedding over the history of time and events between two people, so a quick method for distinguishing *guanxi*-like relations would be to make an informed guess about the duration of time that distinguishes more- from less-strong relations. For example, Quintane and Carnabuci (2016, p. 1348) report that brokerage is more personal between long-term contacts, where long-term is defined by email exchanges that last more than a week. The one-week criterion was selected because the study population's activities had a "weekly rhythm" and employees often spoke of work in terms of weekly intervals.

Alternatively, the duration criterion can be defined contingent on a property visible to scholars reading the analysis. Burt and Burzynska (2017) distinguish *guanxi*-like relations among American investment bankers by noting that relations between colleagues have a decay rate during the first year of over .9 probability for bridge relations versus .3 for relations deeply embedded in mutual colleagues. After a relationship has survived for two years, however, decay rates are similar for both structurally and relationally embedded ties. This suggested that the few relations that survive more than two years among investment bankers are *guanxi*-like. Sure enough, a duration criterion of two years reveals the pattern in Figure 3 (Burt and Burzynska 2017, p. 234; Burt and Batjargal 2018, p. 10): desire to work together in relations more than two years old is high and relatively independent of structural embedding (solid lines). Desire is lower in younger relations, and contingent on structural embedding (dashed line).

Of course, duration alone does not ensure a *guanxi* tie. Everyone has lost trust in at least a few of their long-term acquaintances. Behavior during difficult events matters. The best research strategy we have found for identifying and studying *guanxi*-like ties is to include in the network survey a name generator eliciting contacts helpful during key events, either in a person's career (Merluzzi and Burt 2021), or in the history of a person's business, as we did here.

A fourth strategy, one we have not yet seen used, is completely data driven. The graph in Figure 1 can be reverse engineered. Given a set of relationships for which there is some measure of trust or cooperation (vertical axis in Figure 1) and some measure of structural embedding (horizontal axis), estimate the rate at which scores on the vertical axis increase on average with scores on the horizontal (dashed line in Figure 1). Now analyze the extent to which individual relations fit the average. Some relations will be deviant because they are unexpectedly high on the vertical axis and poorly predicted by the horizontal. Those deviant relations are *guanxi*-like. They can be studied for network location and characteristics.

Limitations

Our study site is a good beginning, but it has two limitations. The limitations do not concern our inferences about *guanxi* in the West so much as they limit our inferences about *guanxi* in China. Our surveyed cities in the Yangtze delta are at the upper end of cities in terms of institutional quality. Given the interprovincial variations in institutional quality and common claims that the productive value of *guanxi* depends on the quality of formal institutions (Xin and Pearce 1996), a skeptic could claim that the existence and advantage of unembedded *guanxi* may be partly due to the relatively sound institutional environment in which we sampled businesses. We do not have the data to rule out that possibility, however, we note that the initial observation of highly-trusted unembedded event contacts (Burt and Burzynska 2017) was based on a survey six years earlier conducted with a much larger sample drawn from a broader set of cities. Still, replication in institutionally less mature provinces would be welcome.

Equally welcome would be replication studies with different types of respondents. We focus on the *guanxi* of people running small to medium size private companies. A defender of the “*guanxi* implies closure” argument could claim that these managers are particularly dependent on brokerage, which in turn could partly explain the higher productive value of unembedded *guanxi*. There is no strong theoretical argument for such an assumption, which is also countered by the networking activities of China’s business elite in the private sector (Oppen 2023). Nevertheless, replication with leaders in large-scale corporations and state-owned enterprises could provide supportive evidence on whether the productive value of *guanxi* is in some way contingent on the organizational form of the business.

REFERENCES

- Aral, Sinan, and Marshall Van Alstyne. 2011. "Networks, Information and Brokerage: The Diversity-bandwidth Tradeoff." *American Journal of Sociology* 117(1): 90-171.
- Baruch, Yahuda. 1999. "Response Rate in Academic Studies — A Comparative Analysis." *Human Relations* 52: 421-438.
- Batjargal, Bat. 2007a. "Comparative Social Capital: Networks of Entrepreneurs and Venture Capitalists in China and Russia." *Management and Organization Review* 3 (3): 397-419.
- Batjargal, Bat. 2007b. "Internet Entrepreneurship: Social Capital, Human Capital, and Performance of Internet Ventures in China." *Research Policy* 36 (5): 605-618.
- Batjargal, Bat. 2010. "The Effects of Network's Structural Holes: Polycentric Institutions, Product Portfolio, and New Venture Growth in China and Russia." *Strategic Entrepreneurship Journal* 4 (2): 146-163.
- Batjargal, Bat, Michael A. Hitt, Anne S. Tsui, Jean-Luc Arregle, Justin W. Webb, and Toyah L. Miller. 2013. "Institutional Polycentrism, Entrepreneur's Social Networks, and New Venture Growth." *Academy of Management Journal* 56 (4): 1024-1049.
- Bernstein, Lisa. 1992. "Opting out of the Legal System: Extralegal Contractual Relations in the Diamond Industry." *Journal of Legal Studies* 21 (1): 115-157.
- Bernstein, Lisa. 2015. "Beyond Relational Contracts: Social Capital and Network Governance in Procurement Contracts." *Journal of Legal Analysis* 7 (2): 561-621.
- Bian, Yanjie. 1997. "Bringing Strong Ties Back in: Indirect Ties, Network Bridges, and Job Searches in China." *American Sociological Review* 62 (3): 366-385.
- Bian, Yanjie. 2018. "The Prevalence and the Increasing Significance of *Guanxi*." *China Quarterly* 235: 597-621.
- Bian, Yanjie. 2019. *Guanxi: How China Works*. London: Polity Press.
- Bian, Yanjie, and Lulu Li. 2012. "The Chinese General Social Survey (2003-8)." *Chinese Sociological Review* 45 (1): 70-97.
- Bian, Yanjie, and Man Shuai. 2019. "Elective Affinity between *Guanxi* Favouritism and Market Rationality: *Guanxi* Circles as Governance Structure in China's Private Firms." *Asia Pacific Business Review* 26 (2): 149-168.
- Brass, Daniel J. 2022. "New Developments in Social Network Analysis." *Annual Review of Organizational Psychology and Organizational Behavior* 9: 225-246.
- Burt, Ronald S. 1992. *Structural Holes*. Cambridge (MA): Harvard University Press.
- Burt, Ronald S. 2002. "Bridge Decay." *Social Networks* 24: 333-363.
- Burt, Ronald S. 2005. *Brokerage and Closure*. New York: Oxford University Press.
- Burt, Ronald S. 2010. *Neighbor Networks*. New York: Oxford University Press.
- Burt, Ronald S. 2019. "Network Disadvantaged Entrepreneurs: Density, Hierarchy, and Success in China and the West." *Entrepreneurship Theory and Practice* 43 (1): 19-50.
- Burt, Ronald S. 2021. "Structural Holes, Capstone, Cautions, and Enthusiasms." Pp. 384-416 in *Personal Networks*, edited by Mario L. Small, Brea L. Perry, Bernice A. Pescosolido, and Edward B. Smith. Cambridge, UK: Cambridge University Press.

- Burt, Ronald S., and Bat Batjargal. 2019. "Comparative Network Research in China." *Management and Organization Review* 15 (1): 3–29.
- Burt, Ronald S., Yanjie Bian, and Sonja Oppen. 2018. "More or Less *Guanxi*: Trust is 60% Network Context, 10% Individual Differences." *Social Networks* 54: 12–25.
- Burt, Ronald S., Yanjie Bian, Lijun Song, and Nan Lin (2019, Eds.), *Social Capital, Social Support, and Stratification: An Analysis of the Sociology of Nan Lin*. Cheltenham: UK: Edward Elgar Publishing.
- Burt, Ronald S., and Katarzyna Burzynska. 2017. "Chinese Entrepreneurs, Social Networks, and *Guanxi*." *Management and Organization Review* 13 (2): 221–260.
- Burt, Ronald S., and Sonja Oppen. 2017. "Early Network Events in the Later Success of Chinese Entrepreneurs." *Management and Organization Review* 13 (3): 497–537.
- Burt, Ronald S., Sonja Oppen, and Na Zou. 2021. "Social Network and Family Business: Uncovering Hybrid Family Firms." *Social Networks* 65: 141–156.
- Burt, Ronald S., and Giuseppe Soda. 2017. "Social Origins of Great Strategies." *Strategy Science* 2 (4): 226–233.
- Buskens, Vincent, and Arnout van de Rijt. 2008. "Dynamics of Networks if Everyone Strives for Structural Holes." *American Journal of Sociology* 114 (2): 371–407.
- Cartwright, Dorwin, and Frank Harary. 1956. "Structural Balance: A Generalization of Heider's Theory." *Psychological Review* 63 (5): 277–293.
- Centola, Damon. 2018. *How Behavior Spreads*. Princeton, NJ: Princeton University Press.
- Centola, Damon, and Michael Macy. 2007. "Complex Contagions and the Weakness of Long Ties." *American Journal of Sociology* 113 (3): 702–734.
- Chang, Kuang-Chi. 2011. "A Path to Understanding *Guanxi* in China's Transitional Economy: Variations on Network Behavior." *Sociological Theory* 29 (4): 315–339.
- Chen, Xiao-Ping, and Chao C. Chen. 2004. "On the Intricacies of the Chinese *Guanxi*: A Process Model of *Guanxi* Development." *Asia Pacific Journal of Management* 21: 305–324.
- Chen, Chao C., Xiao-Ping Chen, and Shengsheng Huang, S. 2013. "Chinese *Guanxi*: An Integrative Review and New Directions for Future Research." *Management and Organization Review* 9 (1): 167–207.
- Chua, Roy Y. J., Michael W. Morris, and Paul Ingram. 2009. "*Guanxi* vs. Networking. Distinctive Configurations of Affect- and Cognition-based Trust in the Networks of Chinese vs. American Managers." *Journal of International Business Studies* 40 (3): 490–509.
- Coase, Ronald 1937. "The Nature of the Firm." *Economica* 4 (16) 386–405.
- Coleman, James S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94 (S), S95–S120.
- Commons, John R. 1924. *Legal Foundations of Capitalism*. New York: Macmillan.
- Dahlander, Linus, and Daniel A. McFarland. 2013. "Ties that Last: Tie Formation and Persistence in Research Collaborations over Time." *Administrative Science Quarterly* 58(1): 69–110.
- Dunning, John H., and Changsu Kim. 2007. "The Cultural Roots of *Guanxi*." *World Economy* 30 (2): 329–341.
- Ellickson, Robert C. 1991. *Order without Law*. Cambridge (MA): Harvard University Press.

- Fan, Ying. 2002. "Guanxi's Consequences: Personal Gains at Social Cost." *Journal of Business Ethics* 38 (4): 371–380.
- Farh, Jiing-Lih., Anne S. Tsui, Katherine Xin, and Bor-Shiuan Cheng. 1998. "The Influence of Relational Demography and *Guanxi*: the Chinese Case." *Organization Science* 9 (4): 471-488.
- Fei, Xiatong. 1992 [1947]. *From the Soil*. Translated by G. G. Hamilton and W. Zheng. Berkeley, CA: University of California Press.
- Frank, Robert H., Thomas Gilovich, and Dennis T. Regan. 1993. "The Evolution of One-Shot Cooperation: An Experiment." *Ethology and Sociobiology* 14 (4): 247-256.
- Gouldner, Alvin W. 1957. "Cosmopolitans and Locals: Toward an Analysis of Latent Social Roles." *Administrative Science Quarterly* 2(3):, 281-306.
- Gong, Ting. 2004. "Dependent Judiciary and Unaccountable Judges: Judicial Corruption in Contemporary China." *The China Review* 4 (2): 33–54.
- Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78 (6):1360-1380.
- Granovetter, Mark. 1982. "The Strength of Weak Ties: A Network Theory Revisited." Pp. 105-130 in *Social Structure and Network Analysis*, edited by Peter V. Marsden and Nan Lin. Beverly Hills, CA: Sage.
- Granovetter, Mark. 1985. "Economic Action, Social Structure, and Embeddedness." *American Journal of Sociology* 91 (3): 481–510.
- Granovetter, Mark. 1992. "Problems of Explanation in Economic Sociology." Pp. 29-56 in *Networks and Organizations*: edited by Nitin Nohria, and Robert G. Eccles. Boston, MA: Harvard Business School Press.
- Greif, Avner. 1989. "Reputation and Coalitions in Medieval Trade: Evidence on the Maghribi Traders." *Journal of Economic History* 49 (4): 857–882.
- Guilbeault, Douglas, and Damon Centola. 2021. "Topological Measures for Identifying and Predicting the Spread of Complex Contagions." *Nature Communications* 12 (1): 4430.
- Guthrie, Doug. 1998. "The Declining Significance of *Guanxi* in China's Economic Transition." *China Quarterly* 154: 254–282.
- Halevy, Nir, Eliran Halali, and Julian J. Zlatev. 2019. "Brokerage and Brokering: An Integrative Review and Organizing Framework for Third Party Influence." *Academy of Management Annals* 13 (1): 215-239.
- Hardin, Russell. 1991. "Trusting Persons, Trusting Institutions." Pp. 185-209 in *Strategy and Choice*: edited by Richard J. Zeckhauser. Cambridge, MA: MIT Press.
- Hardin, Russell. 2002. *Trust and Trustworthiness*. New York: Russell Sage Foundation.
- Hayek, Friedrich A. 1937. "Economics and Knowledge." *Economica* 4(13): 33-54.
- Hayek, Friedrich A. 1945. "The Use of Knowledge in Society." *American Economic Review* 35(4): 519-530.
- Heider, Fritz. 1946. "Attitude and Cognitive Organization." *Journal of Psychology* 21 (1): 107-12
- Heider, Fritz. 1958. *The Psychology of Interpersonal Relations*. New York: John Wiley.
- Hwang, Kwang-kuo. 1987. "Face and Favor: The Chinese Power Game." *American Journal of Sociology* 92 (4): 944–974.

- Ingram, Paul, and Michael W. Morris. 2010. "Do People Mix at Mixers? Structure, Homophily, and the 'Life of the Party.'" *Administrative Science Quarterly* 52 (4): 558–585.
- Katz, Elihu, and Paul F. Lazarsfeld. 1955. *Personal Influence*. New York: Free Press.
- Kim, Minjae, and Roberto M. Fernandez. 2022. "What Makes Weak Ties Strong?" *Annual Review of Sociology* 49: 177-193.
- Kollock, Peter. 1994. "The Emergence of Exchange Structures: An Experimental Study of Uncertainty, Commitment, and Trust." *American Journal of Sociology* 100 (2): 313–345.
- Krackhardt, David. 1992. "The Strength of Strong Ties: The Importance of Philos in Organizations." Pp. 216-239 in *Networks and Organizations*, edited by Nitam Nohria and Robert G. Eccles. Boston, MA: Harvard Business School Press.
- Krackhardt, David. 1999. "The Ties that Torture: Simmelian Tie Analysis in Organizations." *Research in the Sociology of Organizations* 16: 183-210.
- Kwon, Seok-Woo, Emanuela Rondi, Daniel. Z. Levin, Alfredo De Massis, and Daniel J. Brass. 2020. "Network Brokerage: An Integrative Review and Future Research Agenda." *Journal of Management* 46 (6): 1092-1120.
- Levinthal, Daniel A., and James G. March. 1993. "The Myopia of Learning." *Strategic Management Journal* 14 (S2): 95-112.
- Li, Julie Juan, Laura Poppo, and Kevin Zheng Zhou. 2008. "Do Managerial Ties in China Always Produce Value? Competition, Uncertainty, and Domestic vs. Foreign Firms." *Strategic Management Journal* 29 (4): 383–400.
- Li, Peter Ping, and En Xie. 2019. "The Unique Research on the Informal Ties and Social Networks in East Asia: Diverse Perspectives and New Research Agenda." *Asia Pacific Journal of Management* 36: 305–319.
- Li, Peter Ping, Steven Zhou, Abby Zhou, and Zhangbo Yang. 2019. "Reconceptualizing and Redirecting Research on *Guanxi*: "*Guanxi*" Interaction to Form a Multicolored Chinese Knot." *Management and Organization Review* 15 (3):1-35.
- Lin, Nan. 2001. "*Guanxi*: A Conceptual Analysis." Pp. 153-166 in *The Chinese Triangle of Mainland, Taiwan, and Hong King: Comparative Institutional Analysis*: edited by Alvin Y. So, Nan Lin, and Dudley Poston. Westport, CT: Greenwood.
- Lin, Nan 2017. "*Guanxi*: Sentiment-based Social Exchange." Working Paper, Sociology Department, Duke University.
- Luo, Jar-Der, Meng-Yu Cheng, and Tian Zhang. 2016. "*Guanxi* Circle and Organizational Citizenship Behavior: Context of a Chinese Workplace." *Asia Pacific Journal of Management* 33: 649–671.
- Luo, Yadong. 2003. "Industrial Dynamics and Managerial Networking in an Emerging Market: The Case of China." *Strategic Management Journal* 24 (13): 1315–1327.
- Luo, Yadong. 2008. "The Changing Culture and Business Behavior: The Perspective of Intertwinement between *Guanxi* and Corruption." *International Business Review* 17 (2): 188–193.
- Luo, Yadong, Ying Huang, and Stephanie Lu Wang. 2011. "*Guanxi* and Organizational Performance: A Meta-analysis." *Management and Organization Review* 8 (1): 139–172.
- Marsden, Peter V. 2011. "Survey Methods for Network Data." Pp. 370-388 in *The SAGE Handbook of Social Network Analysis*, edited by John P. Scott, and Peter J. Carrington. Thousand Oaks, CA: Sage Publications.

- Martin, John Levi, and King-To Yeung. 2006. "Persistence of Close Personal Ties Over a 12-Year Period." *Social Networks* 28: 331-362.
- Masuda, Yuta J., Yuqing Liu, Sheila M.W. Reddy, Kenneth A. Frank, Kyle Burford, Jonathan R.B. Fisher, and Jensen Montambault. 2018. "Innovation Diffusion within Large Environmental NGOs through Informal Network Agents." *Nature Sustainability* 1 (4): 190–197.
- Mayer, Roger C., James H. Davis, F. David Schoorman. 1995. "An Integrative Model of Organizational Trust." *Academy of Management Review* 20 (3): 709-734.
- Mellahi, Kamel, and Lloyd C. Harris. 2016. "Response Rates in Business and Management Research: An Overview of Current Practice and Suggestions for Future Direction." *British Journal of Management* 27 (2): 426–437.
- Merluzzi, Jennifer, and Ronald S. Burt. 2021. "One Path Does Not Fit All: A Career Path Approach to the Study of Professional Women Entrepreneurs." *Entrepreneurship Theory and Practice* 45(6): 1366-1383.
- Merton, Robert K. 1949. "Patterns of Influence: Local and Cosmopolitan Influentials." Pp. 441-474 in *Social Theory and Social Structure*, 3rd ed. (1968), edited by Robert K. Merton. New York: Free Press.
- Merton, Robert K., and Elinor Barber. 2004. *The Travels and Adventures of Serendipity*. Princeton, NJ: Princeton University Press.
- Meyerson, Debra, Karl E. Weick, and Roderick M. Kramer. 1996. "Swift Trust and Temporary Groups." Pp. 166-195 in *Trust in Organizations*, Edited by Roderick M. Kramer and Tom R. Tyler. Thousand Oaks, CA: Sage.
- Nee, Victor, and Sonja Oppen. 2010. "Political Capital in a Market Economy." *Social Forces* 88 (5): 2105–2133.
- Nee, Victor, and Sonja Oppen. 2012. *Capitalism from Below. Markets and Institutional Change in China*. Cambridge, MA: Harvard University Press.
- Nolan, Jane, and Chris Rowley. 2020. "Whither Guanxi and Social Networks in China? A Review of Theory and Practice." *Asia Pacific Business Review* 26 (2): 113-123.
- Oppen, Sonja. 2023. "Social Network and Institution-based Strategy Research." *Asia Pacific Journal of Management* 40 (1): 329-351.
- Oppen, Sonja, and Ronald S. Burt. 2021. "Social Network and Temporal Myopia." *Academy of Management Journal* 64 (3): 741-771.
- Oppen, Sonja, Victor Nee, and Hakan J. Holm. 2017. "Risk Aversion and Guanxi Activities: A Behavioral Analysis of CEOs in China." *Academy of Management Journal* 60 (4): 1504–1530.
- Park, Seung Ho, and Yadong Luo. 2001. "Guanxi and Organizational Dynamics: Organizational Networking in Chinese firms." *Strategic Management Journal* 22 (5): 455–477.
- Peng, Mike W., and Yadong Luo. 2000. "Managerial Ties and Firm Performance in a Transition Economy: The Nature of a Micro-macro Link." *Academy of Management Journal* 43 (3): 486–501.
- Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti. 2018. *Egocentric Network Analysis*. New York: Cambridge University Press.
- Putnam, Robert. 1993. *Making Democracy Work*. Princeton (NJ): Princeton University Press.
- Putnam, Robert. 2000. *Bowling Alone*. New York: Simon and Schuster.

- Quintane, Eric, and Gianluca Carnabuci. 2016. "How Do Brokers Broker? Tertius Gaudens, Tertius Iungens, and the Temporality of Structural Holes." *Organization Science* 27 (6): 1343-1360.
- Reagans, Ray, and Bill McEvily. 2003. "Network Structure and Knowledge Transfer: The Effects of Cohesion and Range." *Administrative Science Quarterly* 48 (2): 240–267.
- Rousseau, Denise, Sim B. Sitkin, Ronald S. Burt, and Colin F. Camerer. 1998. "Not So Different After All: A Cross-disciplinary Review of Trust." *Academy of Management Review* 23 (3): 393–404.
- Ruan, Danching. 1998. "The Content of the General Social Survey Discussion Networks: An Exploration of the General Social Survey Discussion Name Generator in a Chinese Context." *Social Networks* 20 (3): 247–264.
- Samila, Sampsa, Alexander Oetti, and Sharique Hasan. 2021. "Helpful Behavior and the Duration of Collaborative Ties." *Organization Science* 33 (5): 1816-1836.
- Schumpeter, Joseph A. 1934 [1911]. *The Theory of Economic Development*, translated by Redvers Opie. Cambridge, MA: Harvard University Press.
- Stovel, Katherine, Benjamin Golub, and Eva M. Meyerson Milgrom. 2011. "Stabilizing Brokerage." *Proceedings of the National Academy of Sciences* 104: 21326-21332.
- Stovel, Katherine, and Lynette Shaw. 2012. "Brokerage." *Annual Review of Sociology* 38: 139-158.
- Tasselli, Stefano, and Martin Kilduff. 2021. "Network Agency." *Academy of Management Annals* 15(1): 68-110.
- Ter Wal, Anne L. K., Oliver Alexy, Jörn Block, and Philipp G. Sandner. 2016. "The Best of Both Worlds: The Benefits of Open-specialized and Closed-diverse Syndication Networks for New Ventures' Success." *Administrative Science Quarterly* 61 (3): 393–432.
- Tortoriello, Marco, and David Krackhardt. 2010. "Activating Cross-boundary Knowledge: The Role of Simmelian Ties in the Generation of Innovations." *Academy of Management Journal* 53 (1): 167–181.
- Tortoriello, Marco, Ray Regans, and Bill McEvily. 2012. "Bridging the Knowledge Gap: The Influence of Strong Ties, Network Cohesion, and Network Range on the Transfer between Organization Units." *Organization Science* 23 (4): 1024–1039.
- Tsui, Anne S., and Jiing-Lih Farh. 1997. "Where Guanxi Matters: Relational Demography and Guanxi in the Chinese Context." *Work and Occupations* 24 (1): 56–79.
- van Burg, Elco, Tom Elfring, and Joep P. Cornelissen. 2022. "Connecting Content and Structure: A Review of Mechanisms in Entrepreneur's Social Networks." *International Journal of Management Reviews* 24 (2): 188-209.
- Walder, Andrew G. 1986. *Communist Neo-traditionalism: Work and Authority in Chinese Industry*. Berkeley, CA: University of California Press.
- Xiao, Zhixing, and Anne S. Tsui. 2007. "When Brokerage May not Work: The Cultural Contingency of Social Capital in Chinese High-tech Firms." *Administrative Science Quarterly* 52 (1): 1–31.
- Xin, Katherine R., and Jone L. Pearce. 1996. "Guanxi: Connections as Substitutes for Formal Institutional Support." *Academy of Management Journal* 39 (6): 1641–1658.
- Yan, Pu, and Taha Yasserli. 2017. "Two Diverging Roads: A Semantic Network Analysis of Chinese Social Connection ('Guanxi') on Twitter." *Frontiers in Digital Humanities* 4: 11.
- Yang, Mei-Hui. 1994. *Gifts, Favors, and Banquets*. Ithaca, NY: Cornell University Press.

- Yeung, Irene Y. M., and Rosalie L. Tung. 1996. "Achieving Business Success in Confucian Societies: The Importance of *Guanxi* (Connections)." *Organizational Dynamics* 25 (2): 54–65.
- Zhao, Chenlin, and Ronald S. Burt. 2018. "A Note on Business Survival and Social Network." *Management and Organization Review* 14 (2): 377–394.

Table 1: Survey Network Items

Name Generator Items	
Founding Event	Who was the one person who was most valuable to you in founding the firm? (384 contacts)
Significant Event Contacts	Now please do the same thing for each of the significant events you listed. The first significant event you listed was (say first event) in (say year). Who was the person most valuable to you during that event? (1,571 contacts)
Most Valued Current Contacts:	Shifting now to business this year, and thinking about people inside or outside your firm, who are the three or four people who have been most valuable to your business activities this year? (1,296 contacts cited)
Difficult Contact	In contrast to people who help and are valued in your business activities, there are usually some people who make life difficult. Without mentioning the person's name, who was the most difficult person to deal with in your business activities this year? Just jot a name or initials in the box below. Only you are going to know who this person is. (384 contacts cited)
Most Valued Employee	Shifting to happier thoughts, who do you think is your most valuable senior employee this year? (383 contacts cited)
Not Elsewhere Classified	Now that you have a list of contacts on the roster worksheet, please look it over quickly. Is there anyone particularly significant for your business who has not been mentioned? If yes, please enter their name at the bottom of the list. There are many people you could mention. These would just be people particularly significant for your business. (9 contacts cited)
Name Interpreter Items	
Contact help	People can be helpful in many ways. The first person you mentioned was particularly valuable when the business was founded. Very briefly, what did the person do that was so helpful? (repeat for each contact cited on the event name generators; open ended responses coded here as resources, emotional support, referral, or other)
Gender	Male / female
Emotional Closeness to contacts	Especially close (one of your closest contacts), close (but not one of your closest), less close (don't mind working with the person, but don't wish to develop a friendship), distant (don't enjoy time with the person)
Duration of connection	Years known
Frequency	Frequency of contact during last six months (daily, weekly, monthly, less often)

Table 1: Survey Network Items

Communication channels	With modern technology, people can communicate in many ways. During the last year, how have you communicated with the listed people?" (circle all that apply: face-to-face, video call, voice, text-email, text-other, other)
Trust	1-5, definitely no to definitely yes Consider the extent to which you trust each of the listed people. For example, suppose one of the people asked for your help. The help is not extreme, but it is substantial. It is a level of help you cannot offer to many people. To what extent would you trust each person to give you all the information you need to decide on the help? For example, if the person was asking for a loan, would they fully inform you about the risks of them being able to repay the loan? If the person was asking you to give a job to one of their relatives, would they fully inform you about their relative's poor work attitude or weak abilities, or other qualities that would make you prefer not to hire the relative?
Collaboration	1-5, definitely no to definitely yes Collaboration requires more than trust in the information a person will give you. It requires trust that the other person will be able to do his or her share of the work, and be honest about costs. Consider the extent to which you would be willing to collaborate in a business venture with each of the listed persons. For example, suppose that one of your contacts came to you with a business idea, asking you to enter into a joint venture with them to develop and launch the idea. The idea looks good to you and you have the resources to participate in the venture, but is the contact the right person to work with? Can you trust this person to do their share of work, or hire the right people to do their share of the work? Can you trust them to keep honest accounts of costs and income? (Score: 1–5, <i>definitely no</i> to <i>definitely yes</i>)
Contact's role	Circle all that apply: family, neighbor, party, childhood, classmate, military, colleague (current organization) past colleague (prior organization), other
Matrix of connections	Especially close, distant, or something in between

Table 2: *Guanxi* Name Interpreters

A. Are you familiar with the word <i>guanxi</i> ? (365 respond yes, 95%)
B. If no, skip to question C. If yes, ask: When there is <i>guanxi</i> between two people that tells you certain things about their relationship. In your own words, how would you describe to a foreigner the relationship between two people who have <i>guanxi</i> with each other? (Open ended response)
C. In general, people say that <i>guanxi</i> exists when two people feel morally obligated to help one another without the expectation of a direct compensation. Look over the list of your business contacts. Thinking of <i>guanxi</i> as feeling a moral obligation to help each other, with whom do you feel you have the strongest <i>guanxi</i> relationship? Just read the number next to the name of the person. (398 contacts named as “strongest <i>guanxi</i> ”)
D. Are there any other people on the list with whom you have almost as strong a <i>guanxi</i> relationship as your relationship with the person you just named, contact "number named in question C"? (389 contacts named as “other <i>guanxi</i> ”)
E. In terms of the general understanding of <i>guanxi</i> as feeling a moral obligation to help each other, which people on the list definitely do not have a <i>guanxi</i> relationship with you? (274 contacts named as “not <i>guanxi</i> ” which leaves 1,641 “just business” contacts as neither “ <i>guanxi</i> ” nor “not <i>guanxi</i> ”)

Table 3. Relationship Characteristics

Kind of content	ID	Relation content	% Relations with row content
Question on which manager cited the contact (can be more than one)	1	Valued in founding the business	14.2
	2	Valued in most important event	14.2
	3	Valued in other significant event(s)	46.6
	4	Valued current contact	48.0
	5	Most difficult contact this year	14.2
	6	Most valuable employee	14.2
	7	Valued, N.E.C.	0.3
Manager's role relation with the contact (can be more than one)	8	Family	7.7
	9	Neighbor	8.1
	10	Party member	0.6
	11	Childhood friend	4.2
	12	Classmate	11.6
	13	Colleague in military service	6.2
	14	Colleague in current business	47.4
	15	Colleague in prior business	10.0
	16	Investor in current business	2.7
	17	Partner in current business	5.3
	18	Customer for current business	5.8
	19	Supplier for current business	1.9
Why manager values the contact	20	Competitor to current business	1.3
	21	Resources	29.6
	22	Emotional support	4.7
	23	Referrals	20.8
	24	Other support	16.6
Duration of manager's relationship with the contact	25	Less than 6 years	26.2
	26	6 to 10 years	39.4
	27	11 to 20 years	25.1
	28	More than 20 years	9.3
Frequency with which manager meets the contact	29	Daily	25.5
	30	Weekly	35.5
	31	Monthly	26.4
	32	Less than monthly	12.7
How manager communicates with the contact (can be more than one)	33	Face to face	84.0
	34	Video	13.7
	35	Voice	79.7
	36	Email	46.3
	37	Text	45.9
Manager's emotional connection with the contact	38	Especially close	29.8
	39	Close	53.7
	40	Less than close	11.4
	41	Distant	5.1
Manager's trust in the contact	42	Low Trust (1 or 2 rating)	9.0
	43	Some Trust (3 rating)	10.5
	44	Trust (4 rating)	44.7
	45	Highest Trust (5 rating)	35.8
Manager's inclination to collaborate in joint venture with the contact	46	Unlikely to collaborate (1 or 2 rating)	11.1
	47	Might collaborate (3 rating)	13.8
	48	Likely to collaborate (4 rating)	38.3
	49	Definitely collaborate (5 rating)	36.9
Manager's sense of contact as <i>guanxi</i>	50	Not <i>guanxi</i>	10.1
	51	Routine business irrelevant to <i>guanxi</i>	60.7
	52	Other <i>guanxi</i>	14.4
	53	Strongest <i>guanxi</i>	14.7

Table 4: Statistical tests for Closure-Trust Association Distinguishing *Guanxi* Ties (depicted in Figure 3)

	Significant Events Define <i>Guanxi</i>		Respondents Define <i>Guanxi</i>			
	M1	M2	M3	M4	M5	M6
Intercept (alpha in Figure 1)	2.67	2.67	2.84	2.85	2.84	2.86
Structural embedding (log third parties, beta in Figure 1)	.67 (.07)	.67 (.07)	.78 (.06)	—	.78 (.06)	—
Structural embedding (log weighted third parties)	—	—	—	.94 (.06)	—	.94 (.06)
Level adjustment <i>guanxi</i> ties (gamma, Figure 1)						
All <i>guanxi</i>	1.25 (.10)	—	1.48 (.08)	.95 (.03)	—	—
Strongest <i>guanxi</i>	—	1.81 (.12)	—	—	1.63 (.09)	1.05 (.04)
Other <i>guanxi</i>	—	1.10 (.11)	—	—	1.33 (.10)	.84 (.04)
Slope adjustment <i>guanxi</i> ties (lambda, Figure 1)						
All <i>guanxi</i>	-.31 (.07)	—	-.44 (.06)	-.57 (.06)	—	—
Strongest <i>guanxi</i>	—	-.45 (.09)	—	—	-.48 (.06)	-.61 (.06)
Other <i>guanxi</i>	—	-.28 (.07)	—	—	-.40 (.07)	-.54 (.08)
R ²	.40	.43	.43	.45	.44	.46

Note: OLS results predicting trust in 2,702 cited contacts measured on a five-point scale as displayed in Figure 3. Includes respondent fixed effects and robust standard errors in parentheses (Stata “jackknife” option). All coefficients reject the null hypothesis at beyond a .001 level of confidence.

Table 5: Descriptive Statistics for Table 4 (n = 2,702)

		Mean	Std. dev	1	2	3	4	5	6
1	Trust	4.03	1.01	—	.24	.29	.45	.29	.22
2	Structural embedding (count)	1.17	0.66	.24	—	.93	.10	.05	.06
3	Structural embedding (weighted)	0.96	0.59	.29	.93	—	.14	.06	.09
4	All <i>guanxi</i>	0.29	0.45	.45	.03	.05	—	.29	.74
5	Strongest <i>guanxi</i>	0.15	0.35	.34	.03	.04	.65	—	-.43
6	Other <i>guanxi</i>	0.14	0.35	.24	.01	.02	.64	-.17	—

Note: Row variables and correlations below the diagonal are based on respondent definitions of which contacts are *guanxi*. Above the diagonal, correlations are based on *guanxi* inferred, as in previous research, from respondents naming contacts valued for helping the respondent manage significant events in the history of the respondent's business. Structural embedding is measured as log (1 + count or weighted sum of indirect connections through third parties).

Table 6: Predicting performance as return on assets

	M7	M8	M9	M10
<i>Guanxi</i> embedding (count third parties)	-3.67** (1.18)		-2.95* (1.17)	
<i>Guanxi</i> embedding (weighted sum TP)		-4.24*** (1.27)		-3.28* (1.28)
Net Constraint (exclude strongest <i>guanxi</i>)			-5.79** (2.01)	-5.48** (2.08)
CEO male	-.09 (1.77)	-.26 (1.75)	-.06 (1.74)	-.17 (1.73)
CEO age (years)	.05 (.12)	.07 (.12)	.07 (.12)	.08 (.12)
CEO founder	-.02 (2.15)	.32 (2.17)	-.33 (2.12)	-.03 (2.13)
CEO education (years)	-.09 (.34)	-.07 (.33)	.05 (.34)	.05 (.34)
CEO party member	-.81 (2.16)	-.90 (2.12)	-.75 (2.18)	-.87 (2.15)
Assets at firm founding (millions of CNY)	-.006 (.02)	-.001 (.02)	.002 (.02)	.005 (.02)
Years to firm profitability	-.59** (.20)	-.59** (.20)	-.67*** (.20)	-.66*** (.20)
IT	4.75*** (1.48)	4.74*** (1.47)	4.57** (1.46)	4.57** (1.46)
City	YES	YES	YES	YES
Constant	25.12	23.72	43.33	41.25
N	381	381	381	381
R ²	.14	.14	.16	.16

Note: Performance is the average return on assets between 2015 and 2017. OLS estimations with jackknife standard errors in parenthesis and city fixed effects. Network constraint is entered as log constraint to capture nonlinear network-performance association (Figure 4). *Guanxi* embedding is entered as log scores to capture nonlinear associations (Figure 3). Three observations are lost to missing data (footnote 7).

*** $P \leq 0.001$ ** $P \leq 0.01$. * $P \leq 0.05$.

Table 7: Descriptive statistics for Table 6 (n = 381)

		Mean	Std. dev	1	2	3	4	5	6	7	8	9	10	11	12
1	Return on assets	22.22	14.20	1.00											
2	<i>Guanxi</i> embedding (count third parties)	3.11	2.08	-.19	1.00										
3	<i>Guanxi</i> embedding (weighted sum TP)	2.30	1.66	-.18	.89	1.00									
4	Net Constraint (exclude top <i>guanxi</i>)	45.49	14.76	-.22	.18	.24	1.00								
5	CEO male	.84	.36	.03	-.03	-.02	-.02	1.00							
6	CEO age (years)	43.56	7.04	.02	.05	.13	.01	.22	1.00						
7	CEO founder	.84	.37	.06	-.03	.05	.00	.01	.35	1.00					
8	CEO education (years)	15.19	2.33	-.04	.19	.17	.18	-.02	-.32	-.17	1.00				
9	CEO party member	.12	.33	-.09	.19	.15	.07	.05	.10	.03	.06	1.00			
10	Assets at firm founding (millions of CNY)	12.80	32.82	.01	.23	.32	.12	.10	.13	.10	.13	.02	1.00		
11	Years to firm profitability	2.04	2.95	-.09	-.03	-.05	-.10	.06	-.04	-.42	.02	-.02	-.06	1.00	
12	IT	.50	.50	.17	.02	.01	-.02	.02	-.25	-.03	.32	.02	-.03	-.09	1.00

Note: There are 381 observations on *guanxi* embedding (footnote 8), so correlations are computed with pairwise deletion.

Alpha — average trust in a cited routine business bridge relation

Gamma — increase in trust if bridge is to an event contact

Beta — average increase in trust associated with the log of mutual contacts embedding a cited routine business relationship

Lambda — adjustment to beta when relationship is with an event contact

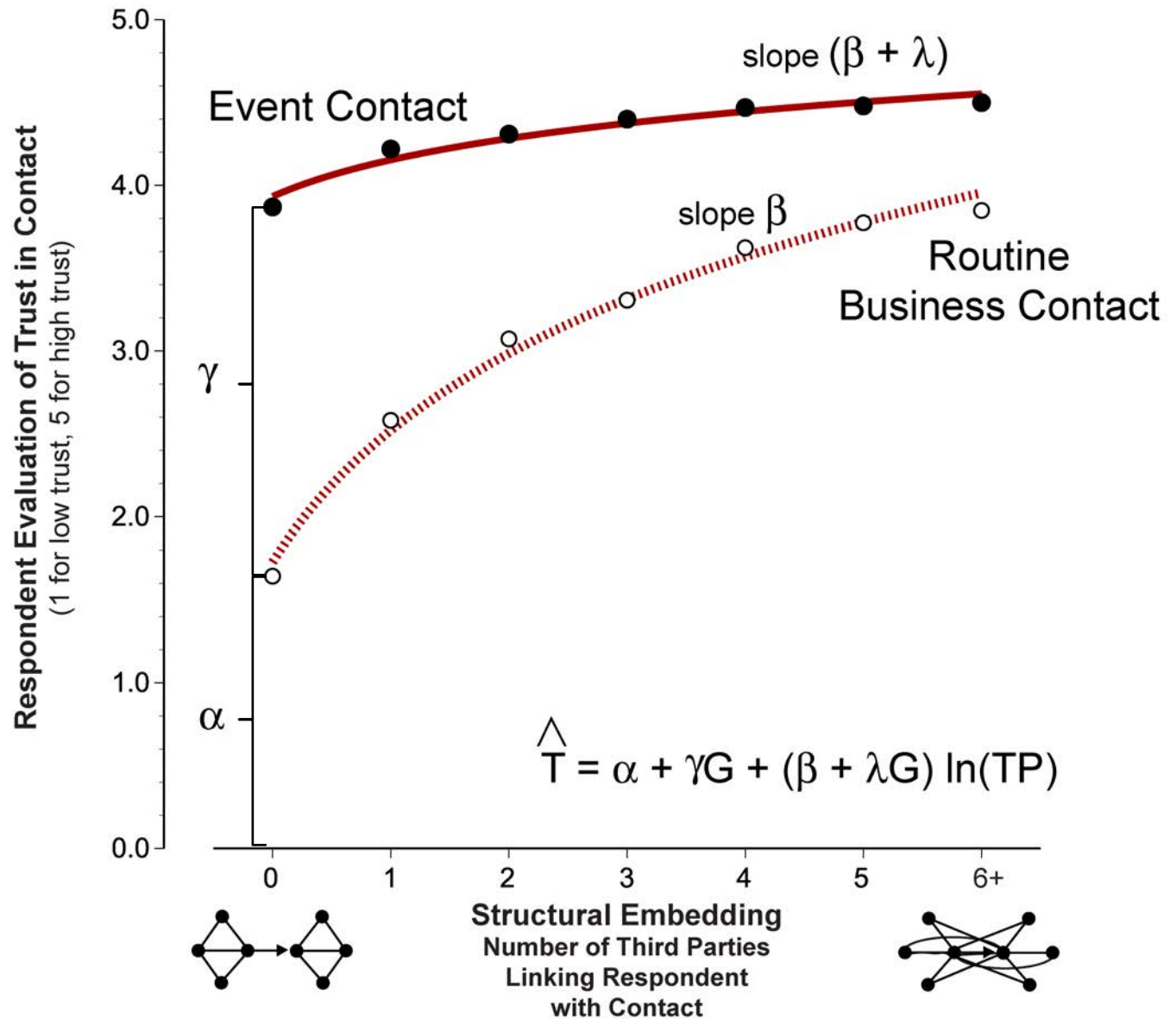


Figure 1. Closure-Trust Association

NOTES: Dots are average scores on vertical axis at each level of horizontal. Vertical axis is mean respondent trust in a contact, measured on a five-point scale (T). Horizontal axis is closure measured by number of mutual contacts (count of third parties, TP). G is a dummy variable equal to 1 for a *guanxi* tie, here operationalized by a citation as the most valued contact in a significant event. Parameter estimates are OLS across 4,464 cited relationships. Graph is adapted with permission from Burt, Bian, and Opper (2018:14).

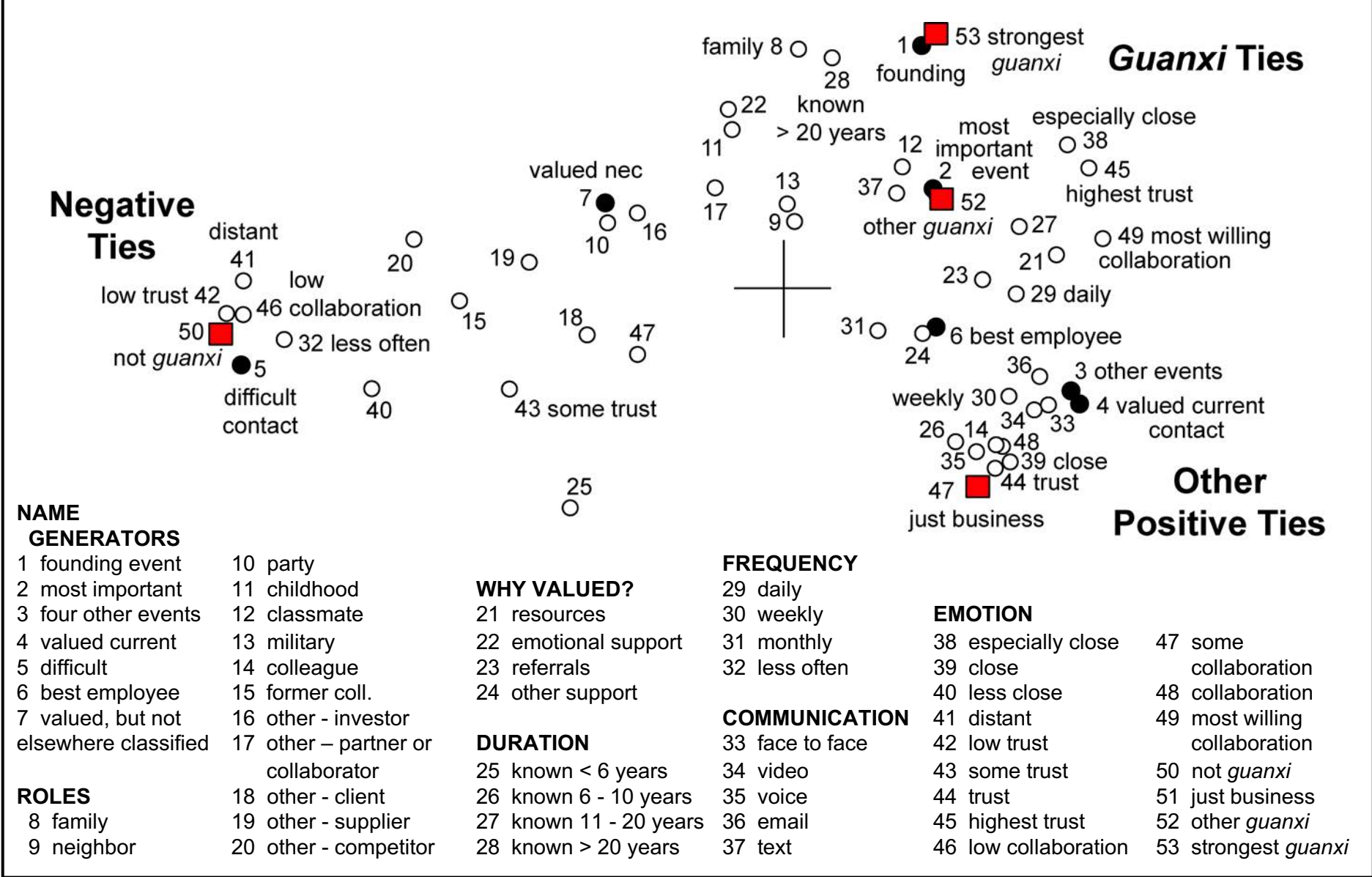


Figure 2. Kinds of Relationships

NOTES: Classical multidimensional scaling of Jaccard coefficients measuring co-occurrence of characteristics in same relations. Axes are proportional in length to the eigenvalues defining them. Cross-hair marks (0,0) point on the axes. The two dimensions describe 92% of variance in the 53 characteristics. Solid circles are name generators. Solid squares are respondent-reported *guanxi* categories.

A. Significant Events Define *Guanxi*

B. Respondents Define *Guanxi*

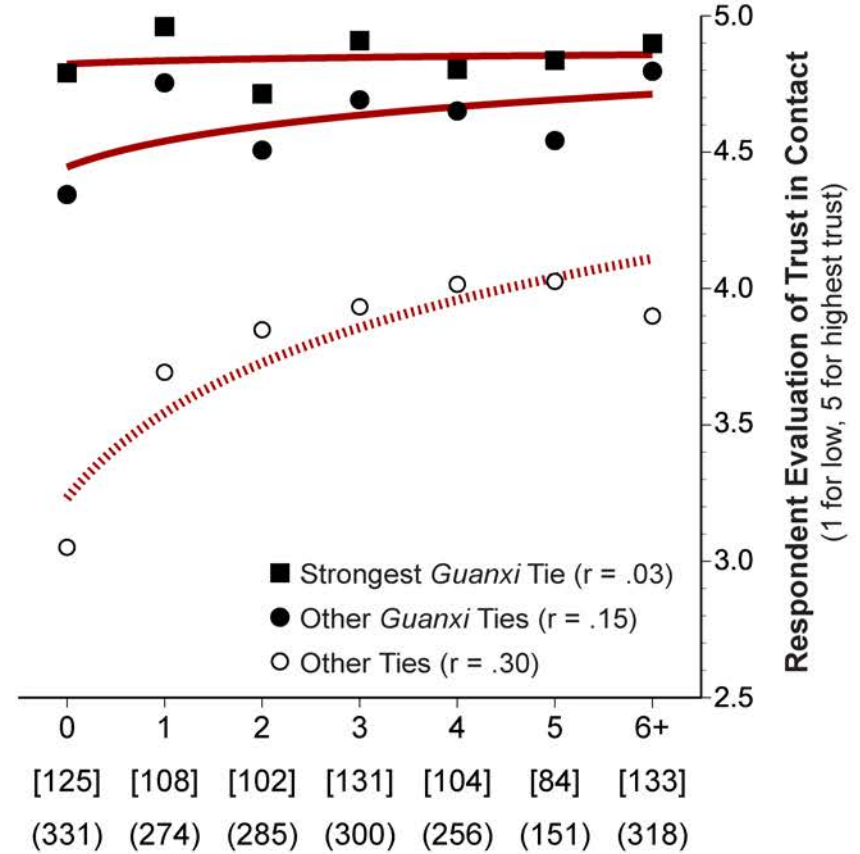
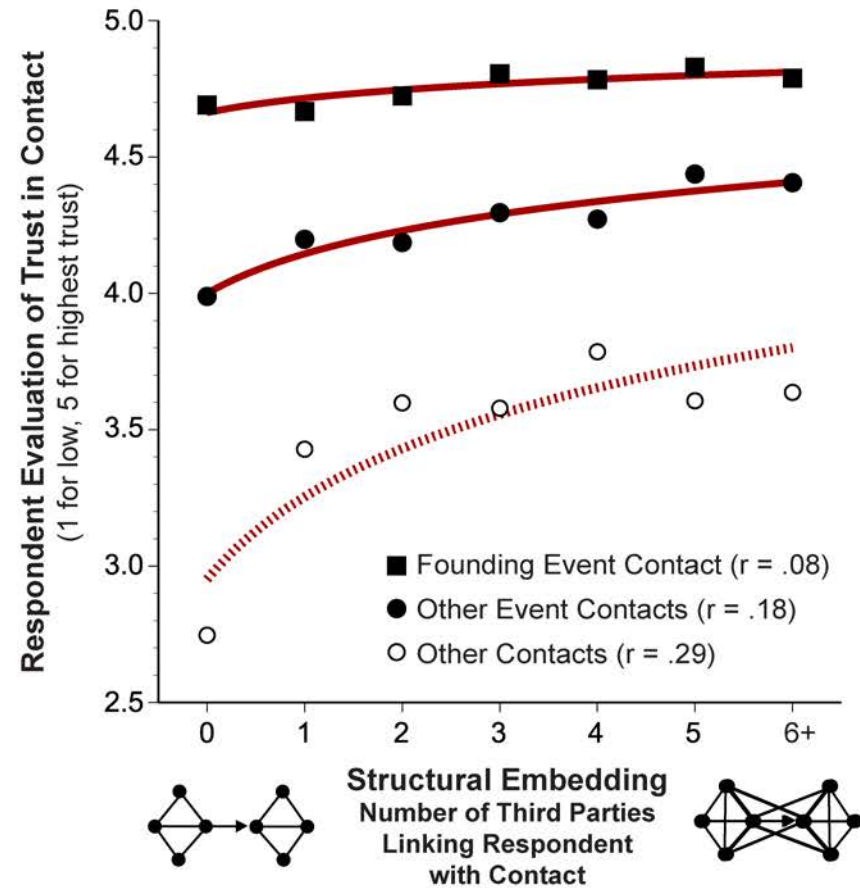
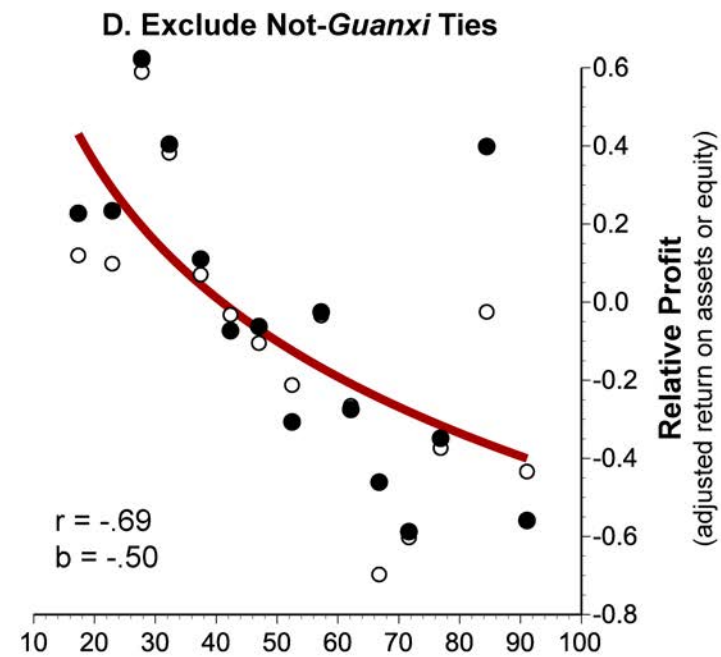
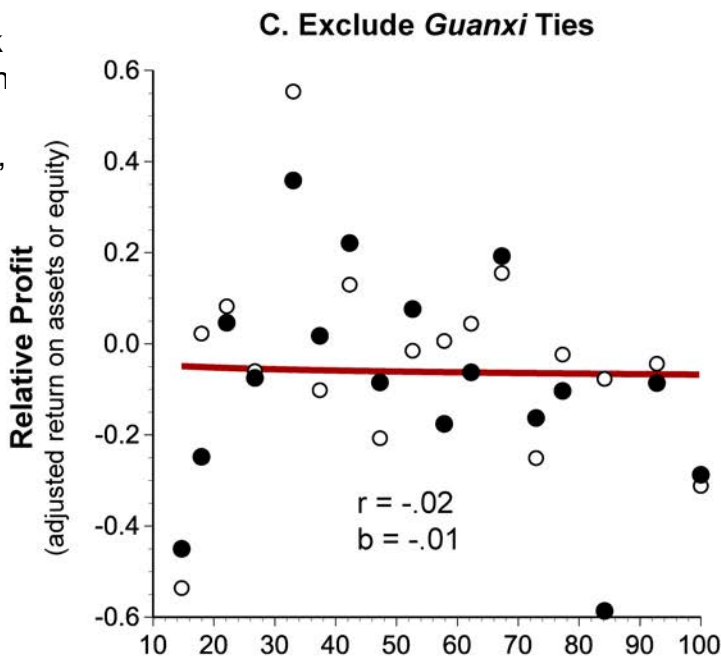
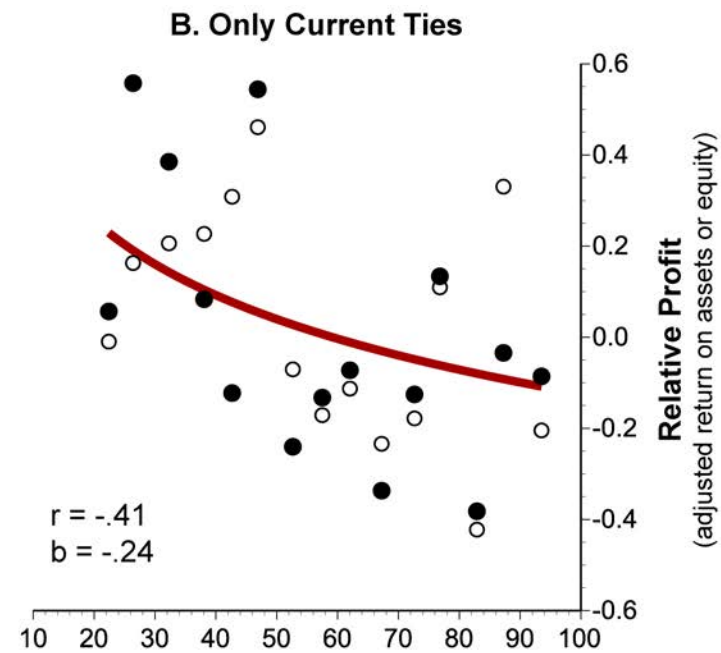
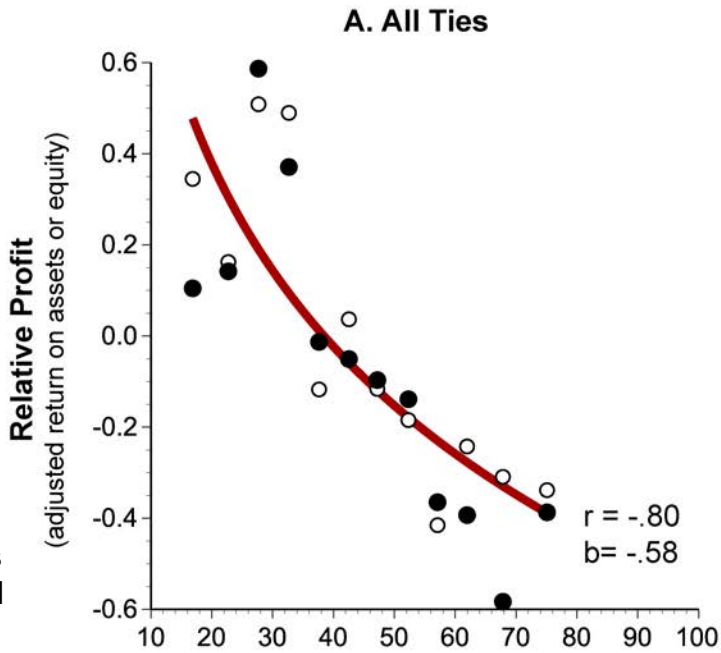


Figure 3. Closure-Trust Association More Obvious with *Guanxi*

NOTES: Dots are average Y scores at each level of X. Graphs describe relationships with 2,702 contacts cited by 384 respondents. Vertical axis is mean respondent trust, measured on a five-point scale. Horizontal axis is the number of other people in a respondent's network connected with the contact being evaluated for trust. Correlations are computed between plotted mean trust and $\log(\text{number third parties})$ across relations within each category. Frequencies to the right below each level of third-party connection show number of [*guanxi* ties] and (other ties).

Figure 4. Guanxi Ties Are Critical to the Network- Performance Association

NOTES: Plotted scores are 384 individual scores on vertical and horizontal axes averaged within five-point intervals of network constraint. Dark dots show average return on assets (adjusted for value of business assets, years from founding until business was profitable, and industry). Hollow dots show average return on equity (adjusted for value of business equity, years from founding until business was profitable, and industry). Correlations are computed from plotted data with $\log(\text{network constraint})$.



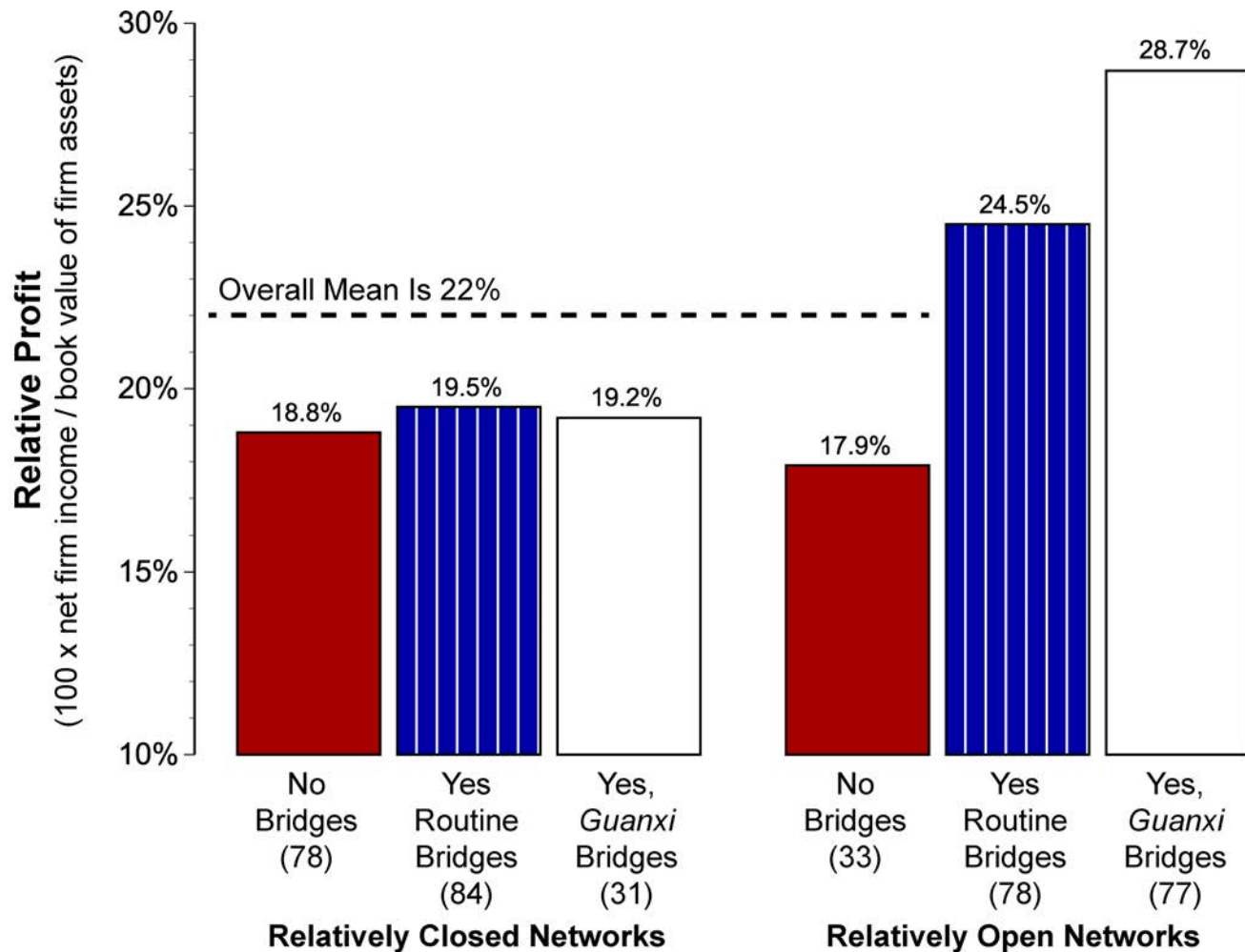


Figure 5. Performance, Networks, Bridges, and *Guanxi* Bridges

NOTE — Bars show mean return on assets (dependent variable in Table 6, here with number of observations in parentheses). Closed versus open networks are distinguished by median network constraint computed from all ties except the strongest *guanxi* (aggregate network constraint predictor in Table 6). A relationship is counted as a bridge when the strength of indirect connection through third parties is less than one (weighted TP in Table 6). Respondents in the solid bar have no bridge relations in their networks. Respondents in the vertical-line bar have bridges, but their strongest *guanxi* is not a bridge. The white bar contains respondents whose strongest *guanxi* tie is a bridge.